



# US HIGHWAY 26

## *WILDLIFE MITIGATION STRATEGY*

DRAFT APRIL 2021

Prepared for

Wyoming Game and Fish Department

Wyoming Department of Transportation

Prepared by

Julia Kintsch, ECO-resolutions



## ACKNOWLEDGMENTS

The US 26 Mitigation Strategy is the product of a broad partnership convened by WGFD and WYDOT to address wildlife connectivity and WVC concerns. Project partners include the Nature Conservancy of Wyoming, Grand Teton National Park, the Eastern Shoshone and Northern Arapaho Tribes, the Shoshone National Forest, the Bureau of Land Management, and the U.S. Fish and Wildlife Service. Project funding was provided by the Knobloch Family Foundation, the Water for Wildlife Foundation and the Wyoming Governor's Big Game Licenses Coalition.

Special thanks are also due to Nyssa Whitford and Courtney Larson for their contributions in conducting GIS analyses and creating the maps included in this report.

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# Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle US Highway 26 Wildlife Mitigation Strategy – DRAFT		5. Report Date	
		6. Performing Organization Code	
7. Author(s) Julia Kintsch		8. Performing Organization Report No.	
9. Performing Organization Name and Address ECO-resolutions Golden, CO 80401		10. Work Unit No. (TRAIS)	
		11. Contract or Grant No.	
12. Sponsoring Agency Name and Address Wyoming Game and Fish Department 5400 Bishop Blvd Cheyenne, WY 82006		13. Type of Report and Period Covered	
		14. Sponsoring Agency Code	
15. Supplementary Notes Prepared in cooperation with the Wyoming Department of Transportation			
16. Abstract US 26 around Dubois is one of the most dangerous highway segments in Wyoming for both motorists and wildlife in terms of wildlife-vehicle collision (WVC) risk. From 2015 through 2019, collisions with wildlife accounted for 74% of all vehicle crashes reported to law enforcement. The cost of these collisions is estimated at \$791,400 annually, including property damage, accident response and cleanup costs, and the value of the wildlife killed in these collisions. To address these issues, in 2020 the Wyoming Game and Fish Department and the Wyoming Department of Transportation initiated wildlife mitigation assessment for US 26/287, engaging other agency, tribal, and non-profit partners. The purpose of the mitigation assessment was to compile and evaluate wildlife habitat and movement data, WVC datasets, and other information to inform the development of cost-effective mitigation solutions for reducing WVC, improving driver safety, and maintaining permeability for wildlife movement across US 26 from mileposts 24-73. The resulting mitigation strategy was informed by community feedback and outlines a common vision that identifies and prioritizes important wildlife movement areas and wildlife-highway conflict zones on US 26 around Dubois, with site-specific mitigation recommendations identified in each segment. Within the study area, two segments were prioritized: 1) east of Dubois from the Wind River oxbow to the Military Vehicles Museum, mileposts 58-64, and 2) from Stony Point to the western limits of Dubois, mileposts 48-54.			
17. Keywords Mule deer, wildlife mitigation, wildlife-vehicle collisions, winter range		18. Distribution Statement	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages	22. Price

Form DOT F 1700.7 (8-72)

Reproduction of completed page authorized

## TABLE OF CONTENTS

<b>WILDLIFE AND WILDLIFE CONFLICT ON US 26</b>	<b>1</b>
BACKGROUND	1
PROJECT PARTNERSHIP	2
STUDY AREA	3
WILDLIFE POPULATIONS AND MOVEMENT PATTERNS	3
<i>Mule Deer</i>	3
<i>Elk</i>	7
<i>Bighorn Sheep</i>	7
<i>Moose</i>	7
<i>Pronghorn</i>	7
<i>White-tailed deer</i>	7
WILDLIFE-VEHICLE CONFLICT AND HUMAN SAFETY	7
<b>MITIGATION STRATEGY FOR US 26</b>	<b>12</b>
MITIGATION ASSESSMENT OBJECTIVES AND APPROACH	12
<i>Right-of-Way Fence Survey</i>	14
<i>Public Outreach and Participation</i>	14
<i>Review of Potential Mitigation Measures</i>	15
MITIGATION SEGMENTS AND MITIGATION RECOMMENDATIONS FOR US 26	19
<i>Segment 1: Milepost 24 – 41, Togwotee Pass to Forest Boundary</i>	20
<i>Segment 2: Milepost 41 – 48, Forest Boundary to Stony Point</i>	22
<i>Segment 3: Milepost 48 – 54, Stony Point to West City Limits</i>	24
<i>Segment 4: Milepost 54 – 56, Dubois</i>	27
<i>Segment 5: Milepost 56 – 58, East Dubois</i>	28
<i>Segment 6: Milepost 58 – 64.5, Longhorn Ranch to Military Vehicles Museum</i>	29
<i>Segment 7: Milepost 64.5 – 69, Military Vehicles Museum to Little Red Creek</i>	34
<i>Segment 8: Milepost 69 – 73, Little Red Creek to Dinwoody Creek</i>	35
<b>NEXT STEPS</b>	<b>36</b>
PUBLIC ENGAGEMENT	36
PRECONSTRUCTION WILDLIFE MONITORING	36
<b>REFERENCES</b>	<b>38</b>
<b>APPENDICES</b>	
<b>APPENDIX A</b>	
<b>APPENDIX B</b>	

## LIST OF FIGURES

Figure 1. Heat map of wildlife-vehicle collision hotspots in Wyoming. ....	1
Figure 2. Map of established and suspected mule deer migration corridors in eastern Wyoming.....	4
Figure 3. Fall and spring migration paths of mule deer wintering in the Dubois area .....	5
Figure 4. Mule deer collar points collected within one mile of either side of US 26 .....	6
Figure 5. Total reported WVC carcasses per year for MP 24-73. ....	8
Figure 6. Annual average number of WVC crash and carcass reports per milepost. ....	9
Figure 7. WVC crashes and carcass reports by species and by milepost .....	10
Figure 8. Total number of WVC in the study area involving deer by month of the year. ....	11
Figure 9. US 26 study area and mitigation segments. ....	13
Figure 10. WVC crash and carcass reports per mile overlaid with the seven mitigation segments. ....	19
Figure 11. Game trail through gap in wildlife fence at the bridge over the Wind River .....	22
Figure 12. Concrete-lined irrigation ditch adjacent to the ROW fence.....	24
Figure 13. Example of woven wire fence and adjacent shrubby vegetation cover .....	24
Figure 14. Reported WVC crashes and carcasses in Segment 6.....	29
Figure 15. Example of a wildlife overpass on State Highway 9 in Colorado.....	30
Figure 16. Mitigation concept for Segment 6.....	33
Figure 17. Wildlife permeable elk-post fence. ....	34

## LIST OF TABLES

Table 1. Miles of each fence type in the study area.....	14
Table 2. Summary of mitigation measures, their effectiveness, use and relative cost, and potential application for US 26. ....	16



## LIST OF ACRONYMS

MP	Milepost
ROW	Right-of-way
TNC	The Nature Conservancy
WVC	Wildlife-vehicle collision
WRR	Wind River Reservation
WGFD	Wyoming Game and Fish Department
WYDOT	Wyoming Department of Transportation

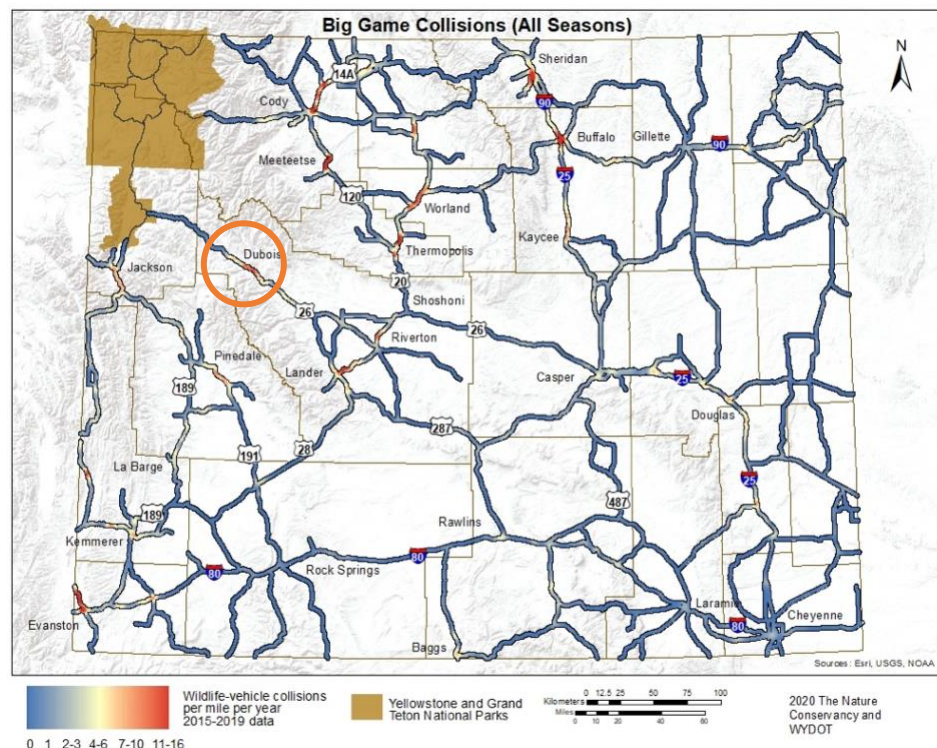
# WILDLIFE AND WILDLIFE CONFLICT ON US 26

## BACKGROUND

Mule deer populations across the western states have generally declined over the last 30 years. Since 1990, mule deer populations in Wyoming have declined approximately 36% due to various factors including weather, habitat, competition, predation, and disease. In addition, the number of mule deer killed each year by vehicles represents approximately 2-4% of the population. In response, the Wyoming Game and Fish Department (WGFD) created the Wyoming Mule Deer Initiative, an effort to stop the decline and work towards growing the herds again (Mule Deer Working Group 2018). The Mule Deer Initiative specifically identifies coordination with the Wyoming Department of Transportation (WYDOT) and other entities to minimize barriers and improve wildlife passage across roads as one of its strategies to maintain healthy mule deer populations.

In April 2017, the WYDOT and WGFD jointly hosted the Wyoming's Wildlife and Roadways Summit, which convened state agencies, non-governmental organizations, members of the public, and other stakeholders to address the conflict that arises where migrating and wintering wildlife intersect with the state's roadway network. Following the Summit, the cooperating agencies formed the Wyoming Wildlife and Roadways Initiative Implementation Team and produced a [Road Map](#) that summarizes the issues raised during the Summit and provides recommendations for improving collaborative partnerships to build capacity and implement more projects, and advancing efforts to reduce wildlife-vehicle collisions (WVC), increase motorist safety, and maintain or reestablish wildlife migrations and habitat connectivity in Wyoming. Through a subsequent prioritization process, US 26/287 (hereafter US 26) around Dubois from Stoney Point to Dinwoody Creek (mileposts 48-73) emerged as one of the top priorities in the state (Fig. 1).

Figure 1. Heat map of wildlife-vehicle collision hotspots in Wyoming based on kernel density analysis (2015-2019 crash and carcass data). Orange circled area is the Dubois US 26 hotspot (map created by C. Riginos, The Nature Conservancy).



The Dubois mule deer herd is a priority herd for WGFD and the WVC mortality rate on US 26 has been an identified concern for many years. US 26 runs northwest to southeast along the Wind River, which provides habitat for resident, migratory and wintering mule deer. During the fall and winter months, mule deer make regular movements across Highway 26 during migration and as they settle into winter range and are frequently subject to WVCs. Bighorn sheep, elk, white-tailed deer, moose, and pronghorn also use this landscape and are occasionally involved in WVCs on US 26

Despite low traffic volumes, WVCs are the leading cause of motor vehicle crashes in this corridor. From 2015 through 2019, WVCs accounted for 74% of all vehicle crashes between MP 48-73. Each year, on average, there are 28 WVC crashes reported to law enforcement and an additional 131 recorded WVC carcasses removed from this section of roadway. The annual cost of these collisions is estimated at \$791,400 including property damage, accident response and cleanup costs, and the value of the wildlife killed in these collisions<sup>1</sup>. Consequently, this stretch of US 26 is one of the most dangerous and costly in the state in terms of WVC risk.

These issues along US 26 are broadly recognized by the public as well as by WYDOT, WGFD, the Wind River Reservation (WRR), and other state and federal agencies and non-governmental organizations. The need for a mitigation assessment was determined by WGFD and WYDOT to develop a more comprehensive strategy for maintaining long-term habitat connectivity for wintering and migrating wildlife across the highway while reducing WVC. Overall, mitigation along this highway segment is challenged by both the ecological and human context of the landscape including, mixed public and private land ownership; diverse land uses along the highway corridor; multiple private driveway access points along the highway; a riparian corridor, which parallels the highway and serves as an attractant for wildlife; and concerns about restricting wildlife movements seasonally and daily.

## PROJECT PARTNERSHIP

The US 26 Mitigation Strategy is the product of a broad partnership convened by WGFD and WYDOT to address wildlife connectivity and WVC concerns. Project partners include The Nature Conservancy of Wyoming (TNC), Grand Teton National Park, the Eastern Shoshone and Northern Arapaho Tribes, the Shoshone National Forest, the U.S. Fish and Wildlife Service, and the Bureau of Land Management. Additional project funding was provided by the Knobloch Family Foundation, the Water for Wildlife Foundation and the Wyoming Governor's Big Game License Coalition.

This partnership was critical to the development of the mitigation strategy. The project partners engaged in multiple meetings throughout the mitigation assessment and strategy development processes, and provided critical data, local expertise, and insight. The final mitigation strategy is a more comprehensive and well-conceived plan than would have been possible without this partner support.

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<sup>1</sup> Crash costs based on the cost of a property damage only WVC (\$5,500) and the value of the wildlife species killed in collisions with vehicles (based on restitution values established by the Wyoming Game and Fish Commission, 2003).



## STUDY AREA

US 26 is a two-lane highway with a posted speed limit of 70 mph east of Dubois and 65 mph west of Dubois. The highway runs parallel to the Wind River, crossing the river in several places. Wintering wildlife are common throughout the valley, on lower elevation slopes and along the river corridor, including narrow strips of habitat and fields between the river and the road.

The identified priority area is a 33-mile segment from milepost (MP 40-73). For the purposes of the mitigation assessment, the study area was extended farther west to MP 24 to encompass migration routes and summer range on Togwotee Pass. While this portion of US 26 experiences a much lower rate of WVC conflict, this area is important for many of the mule deer that winter around the Dubois area.

While high traffic volumes create barriers to wildlife movement, roads with low to moderate traffic volumes are generally the most dangerous for wildlife-vehicle collisions as the perceived risk of mortality is not as high and animals continue to attempt crossing (Seiler 2003). Riginos et al. (2018) determined that mule deer require a minimum of a 60 second gap between vehicles to perform a safe crossing. With daily traffic volumes averaging approximately 1,800 vehicles per day, this segment of US 26 sees, on average, one vehicle every 48 seconds. Through the fall and winter months, following the summer tourist season, mule deer concentrations along the highway corridor are at their highest. During this timeframe traffic volume decreases to 1,100 vehicles per day, which equates to an average of 46 vehicles per hour or about one vehicle every 79 seconds. While this average vehicle spacing is greater than the threshold identified by Riginos et al. (2018), it is still within the nexus of high concentrations of mule deer and moderately low traffic volumes where incidence of WVC is the highest. Once an animal steps onto the road, the risk of colliding with vehicles increases with traffic volume, vehicle speed, road width, and the presence of obstacles such as roadside barriers, fencing or terrain features (Seiler 2003).

Most of the lands adjacent to the highway corridor throughout the study area are privately owned, with parcels ranging in size from residential lots and ranchettes to large ranches. The western portion of the study area is within the Shoshone National Forest, while the eastern extent is encompassed within the boundaries of the WRR. Other federal and state land managers in this landscape include the Bureau of Land Management, Wyoming State Trust Lands, and WGFD Habitat Management Areas. In addition, there are several large ranches held in conservation easement by TNC or the Jackson Hole Land Trust. There are multiple road and driveway access points on US 26 throughout the study area.

## WILDLIFE POPULATIONS AND MOVEMENT PATTERNS

### *MULE DEER*

The landscape around Dubois provides habitat for resident, migratory and wintering mule deer. During the fall and early winter in particular, mule deer make daily movements across Highway 26, prior to settling into winter range in the adjacent hills on either side of the valley. Some mule deer establish winter home ranges that are bisected by US 26 and thus interact with the highway on a daily basis through the winter months. The higher elevation portions of the study area around Togwotee Pass are mapped as mule deer summer range and includes migration routes. University of Wyoming, tribal and

National Park collaring studies have documented migratory movements through this area by animals that winter around Dubois and on the WRR.

In 2016, researchers at the Wyoming Migration Initiative (WMI), TNC, and WGFD began a collaring study of mule deer migrations in the eastern portion of the Greater Yellowstone Ecosystem, including the Dubois herd (Fig. 2). Forty-eight mule deer from the Dubois Herd were collared for varying lengths of time from 2016-2019 (Anderson 2021). While this study is still underway and movement models are not yet available, data from this study were made available for the mitigation assessment. An interactive map of the 2016 spring migration documented by this study, including the Dubois Herd, is available for viewing on the [Wyoming Migration Initiative website](#).

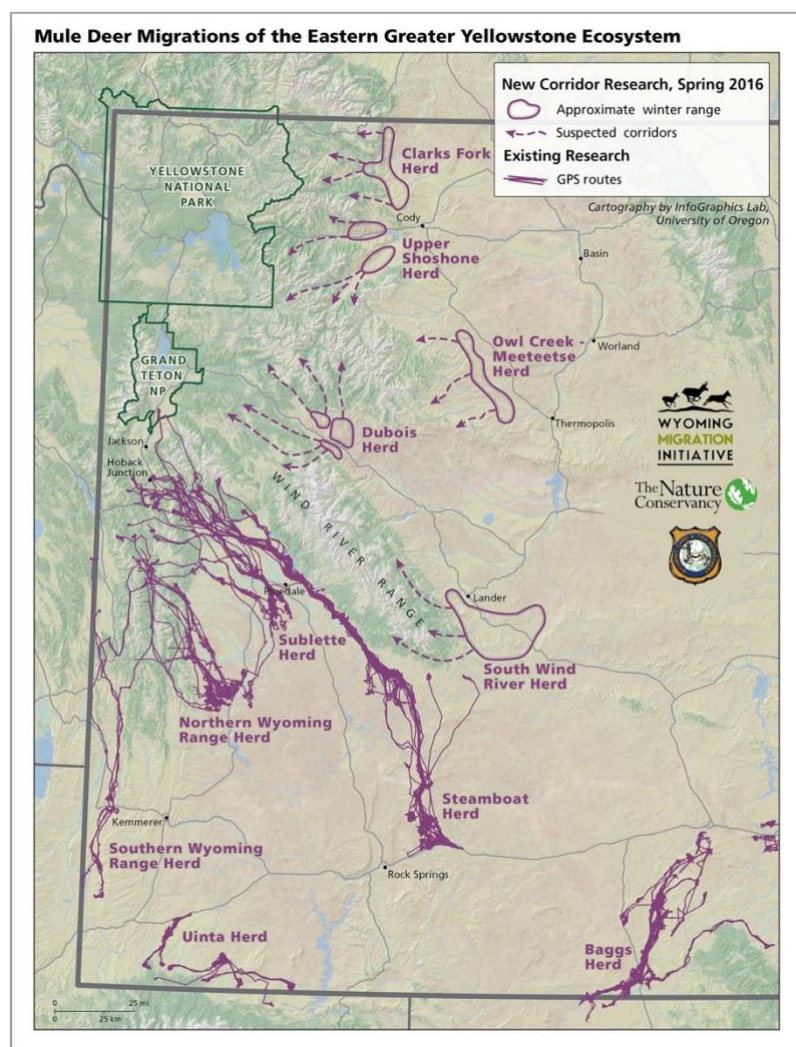


Figure 2. Map of established and suspected mule deer migration corridors in eastern Wyoming. The Dubois herd is one of five herds that is part of a multi-year collaring study to better understand migration movements in this region. The map depicts the general migration paths of mule deer that winter around Dubois. Map courtesy of the Wyoming Migration Initiative.

Mule deer that winter in or migrate through the study area constitute a single, larger population with portions of their ranges managed by different jurisdictions. For example, winter range around Dubois is composed of public and privately owned lands as well as the adjacent WRR. Deer that winter in the

Wind River valley generally migrate west, to higher elevation summer ranges around Togwotee Pass and the southern Absaroka Mountains, in the Gros Ventre, or as far as Grand Teton National Park (Fig. 3).

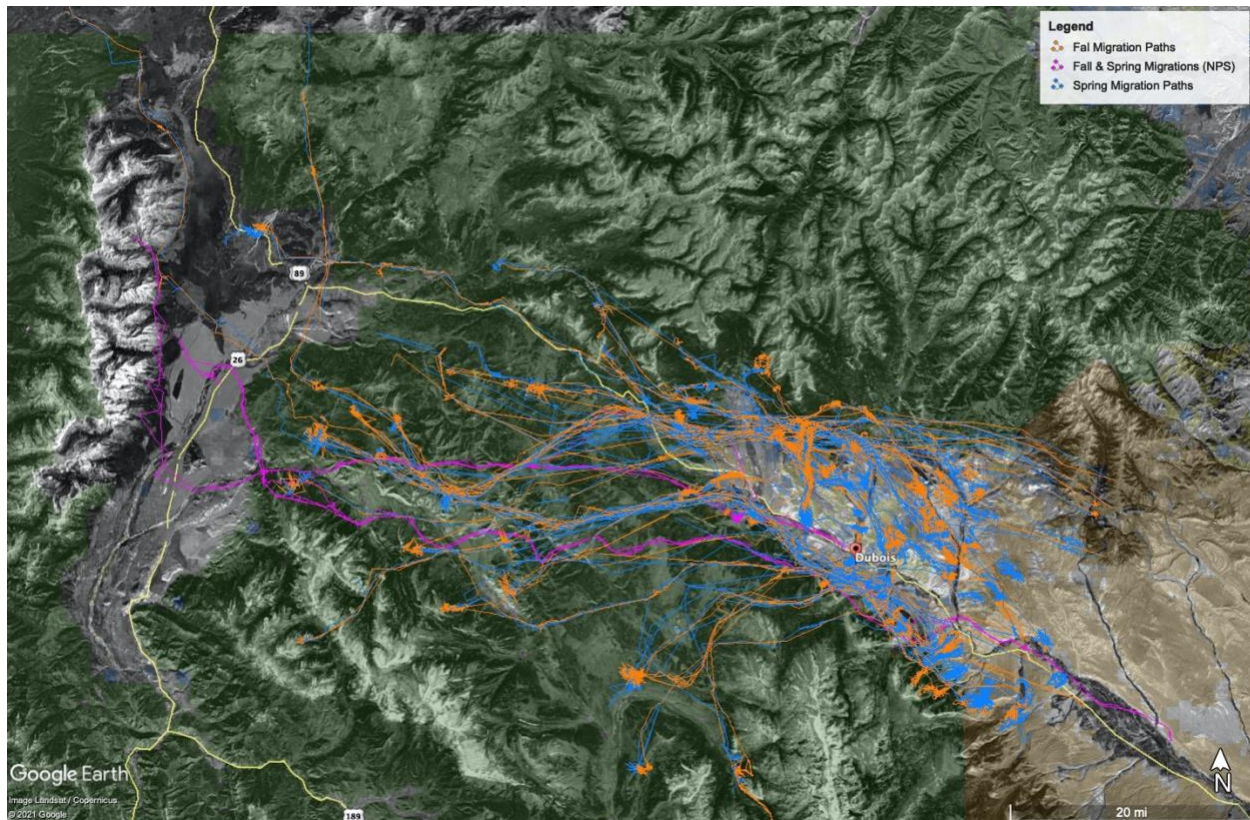


Figure 3. Fall and spring migration paths of mule deer wintering in the Dubois area, based on 63 deer collared by WMI/TNC/WGFD, WRR, and the National Park Service, 2016-2019.

Collar datasets confirm that the fall migration is more dispersed, spatially and temporally, than the more concentrated fall migration. Figure 4 displays the seasonal variation in mule deer activity within one mile of the highway by date, based on the locations of 57 collared animals from 2016-2019 (based on data from WMI/TNC/WGFD and WRR). From left to right, this graph demonstrates that mule deer activity around US 26 is lowest during the mid-winter months of January and February; beginning in March, through early June, mule deer activity adjacent to the highway increases through the spring migration; near-highway activity decreases again during the summer months; and in October, activity levels increase again concurrent with the fall migration, with a peak in November. These seasonal fluctuations in near-highway activity are reflected in the WVC data.



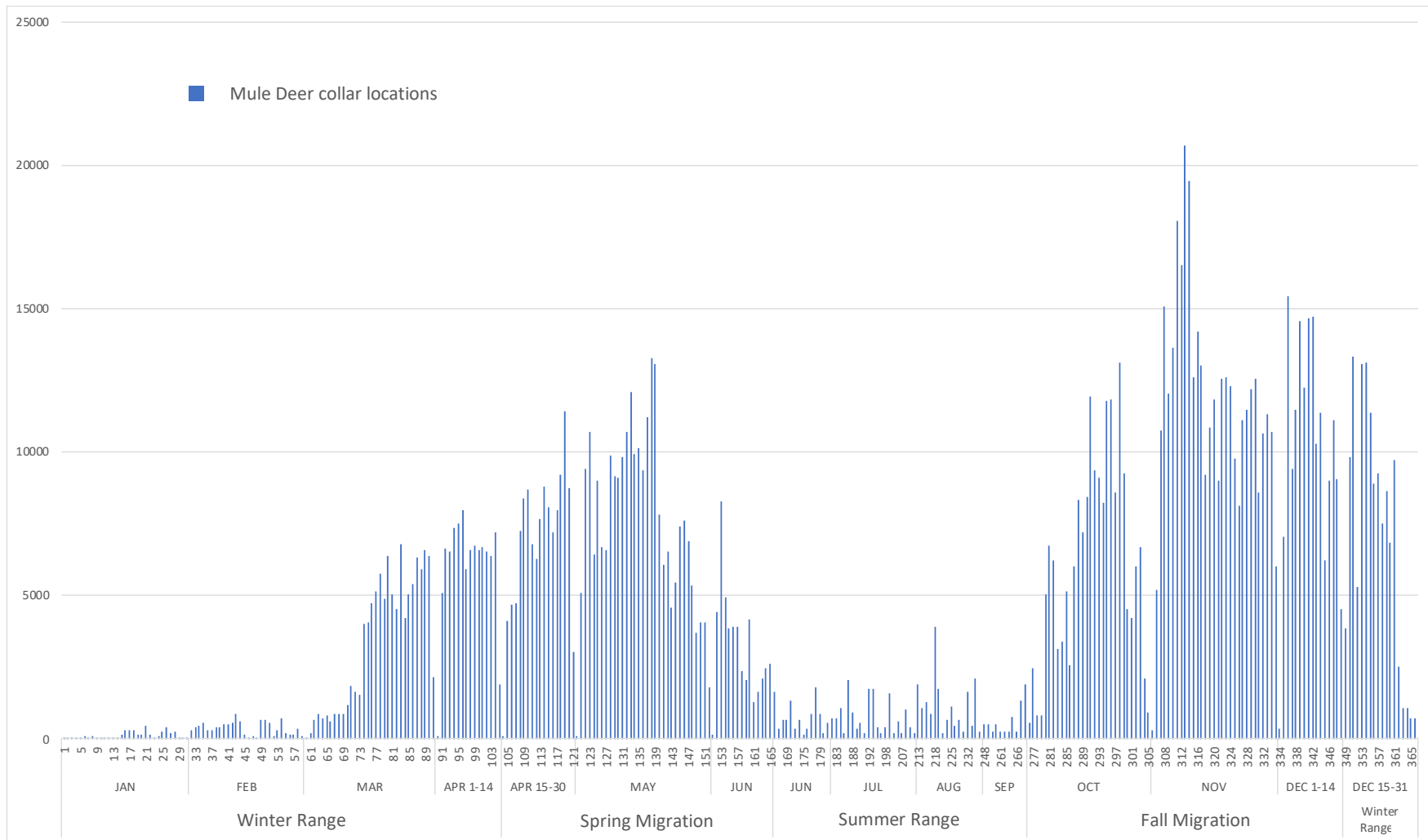


Figure 4. Mule deer collar points collected within one mile of either side of US 26 by day of the year.

### *ELK*

The Spring Mountain elk herd is a sub-population of the Wiggins Fork Elk herd that generally occupies habitat along the north side of US 26 throughout the study area. Cross-highway migratory movements occur primarily around Elk Ridge (MP 36-40) and above the Brooks Lake Creek/Wind River confluence around MP 32.5.

### *BIGHORN SHEEP*

Bighorn sheep activity is concentrated in the Red Rocks portion of the study area, around Little Red Canyon. WGFD collar data demonstrates that this herd remains primarily on the south side of US 26, but regularly crosses US 26 to access the Wind River and the vegetation and/or salt along the roadway, particularly during the fall and winter months.

### *MOOSE*

The moose population along the highway corridor and the Wind River has decreased substantially over the past 20 years and moose-vehicle collisions are rare. However, when these collisions occur, they are of particular concern due to the size of these animals and high potential for motorist injury. WGFD management objectives call for increased moose numbers in this population. An artifact of any future increase in moose numbers would likely be increased potential for collisions. Many of the strategies presented in this plan would also serve to mitigate potential future increases in moose-vehicle collisions.

### *PRONGHORN*

There are year-round, resident pronghorn in the upper Wind River Valley but vehicle collisions with pronghorn are relatively rare compared to collisions with mule deer. Pronghorn is much less numerous than mule deer and are more active diurnally and, as a whole, are not nearly as closely associated with the Wind River and the parallel highway as mule deer. Thus, pronghorn have much less interaction with US 26 than many wintering mule deer that have home ranges overlapping the highway.

### *WHITE-TAILED DEER*

White-tailed deer numbers have increased throughout the upper Wind River Valley over the past couple of decades. White-tailed along the Wind River are year-round residents, and while the population size is increasing, it remains much smaller than the mule deer populations. Accordingly, vehicle collisions with white-tailed deer are much less common than with mule deer. White-tailed deer also have more linear home ranges closely following the Wind River in contrast to mule deer that may cross the highway multiple times each day to access a different portion of their home range.

## **WILDLIFE-VEHICLE CONFLICT AND HUMAN SAFETY**

Wildlife-vehicle collision data are compiled from law enforcement accident reports (crash data) and carcass reports from WYDOT Maintenance patrols. Wildlife-vehicle collisions are widely recognized as being underreported to law enforcement when an accident results in little or no damage to the vehicle and its occupant, or for other reasons. To supplement reported crashes, carcass reports capture WVC that were generally not reported to law enforcement where the animal must be removed from the road or road shoulder. Animals that were hit but managed to exit the road before dying are not captured in

these reports. Research in UT (Olson 2013) and Colorado (Kintsch et al. 2021) found that roadside carcass counts were over 5 times higher than the number of reported crashes and over 1.5 times higher than the number of carcasses reported by maintenance patrols.

Project partners at The Nature Conservancy cleaned and reviewed the crash and carcass datasets to eliminate duplicative records captured in both datasets. The combined WVC dataset offer a more comprehensive picture of the spatial distribution and magnitude of WVC conflict as well as seasonal patterns and changes over time.

From 2015-2019, a total of 187 WVC crashes were reported to law enforcement in the study area from MP 24-73. Deer were involved in 91% of these accidents; other species involved in WVC crashes included elk, pronghorn, and moose. Carcass reports document 714 WVC during this timeframe and describe a similar pattern: 90% of carcass pickups were mule deer; 7% white-tailed deer; and the remainder were elk, pronghorn, moose, or bighorn sheep. WVC carcass reports have generally increased over time in the study segment (MP 24-73) from 59 WVC in 2009 to 134 in 2019, with some annual variation (Fig. 5). The highest number of carcasses were reported in 2016 (184) and 2014 (174). While some of this increase may be due to increased reporting effort over that timeframe, these trends match the increase in WVC observed statewide.

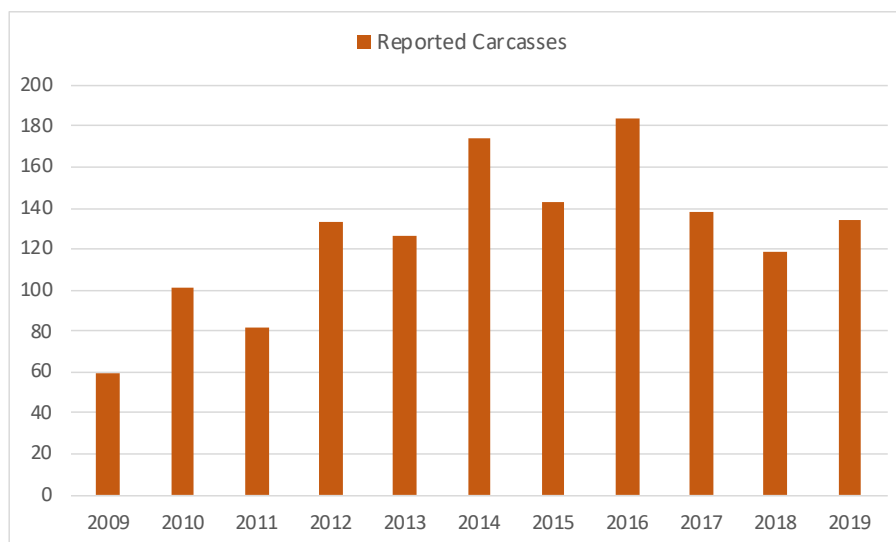


Figure 5. Total reported WVC carcasses per year for MP 24-73.

While WVC occur throughout the study area, they are concentrated in the eastern portion: 88% of all WVC from 2009-2019 occurred between MP 48-72 (Fig 6). On average, there were 6.1 combined WVC crashes and carcasses recorded per mile per year along this stretch of roadway. As traffic volumes increase, the number of WVCs is also expected to increase (Riginos et al. 2016). Huijser et al. (2009) note that wildlife crossings mitigation can create net public benefits along road segments with 5.1 WVCs per mile per year. In the US 26 study area, multiple one-mile segments exceed this threshold. Overall, fewer WVCs occur within the Dubois town limits, where traffic speeds are lower, and in the western portion of



the study area, where mule deer are dispersed in summer range or where they cross only two times per year, during spring and fall migrations.

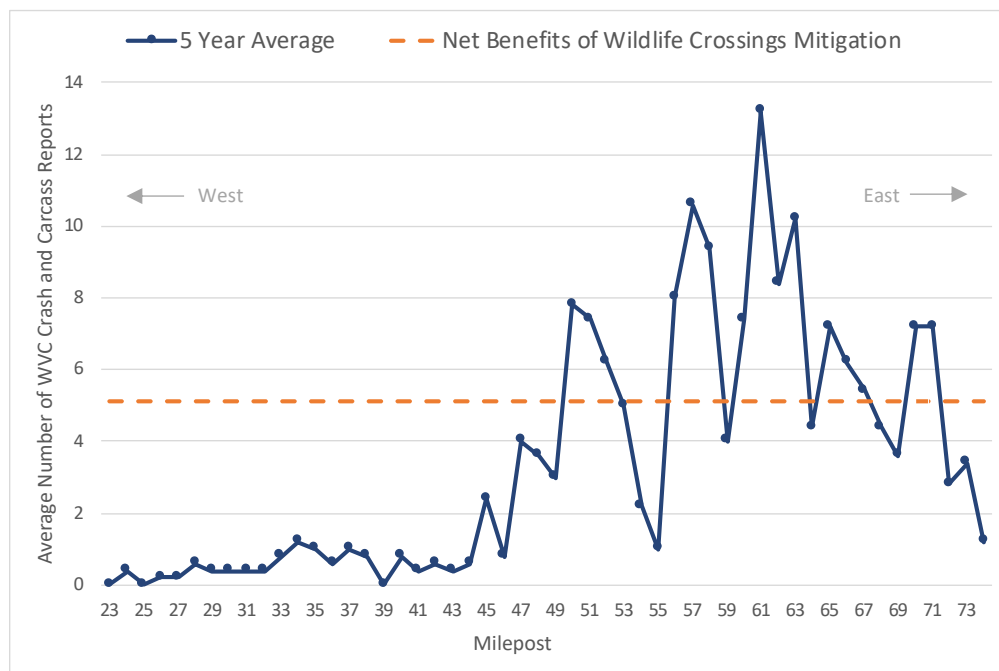


Figure 6. Annual average number of WVC crash and carcass reports per milepost, based on five years of data (2015-2019). At 5.1 WVC per mile per year (orange line), the annual savings from reduced collisions equals the annualized cost of constructing and maintaining wildlife crossings.

While collisions involving mule deer occur throughout the study area (Fig. 7), collisions with other species are more localized. White-tailed deer WVC are concentrated on either side of Dubois, from MP 51-53 and MP 58-69. WVCs involving elk occur primarily in the western half of the study area, with a small spike at MP 58. Pronghorn WVCs are concentrated at the eastern end of the study area, between MP 70-73. While only one bighorn sheep WVC was recorded during the analysis timeframe at MP 69, Little Red Creek, this is a known bighorn sheep crossing area and multiple collisions involving bighorn sheep have been document over the years.

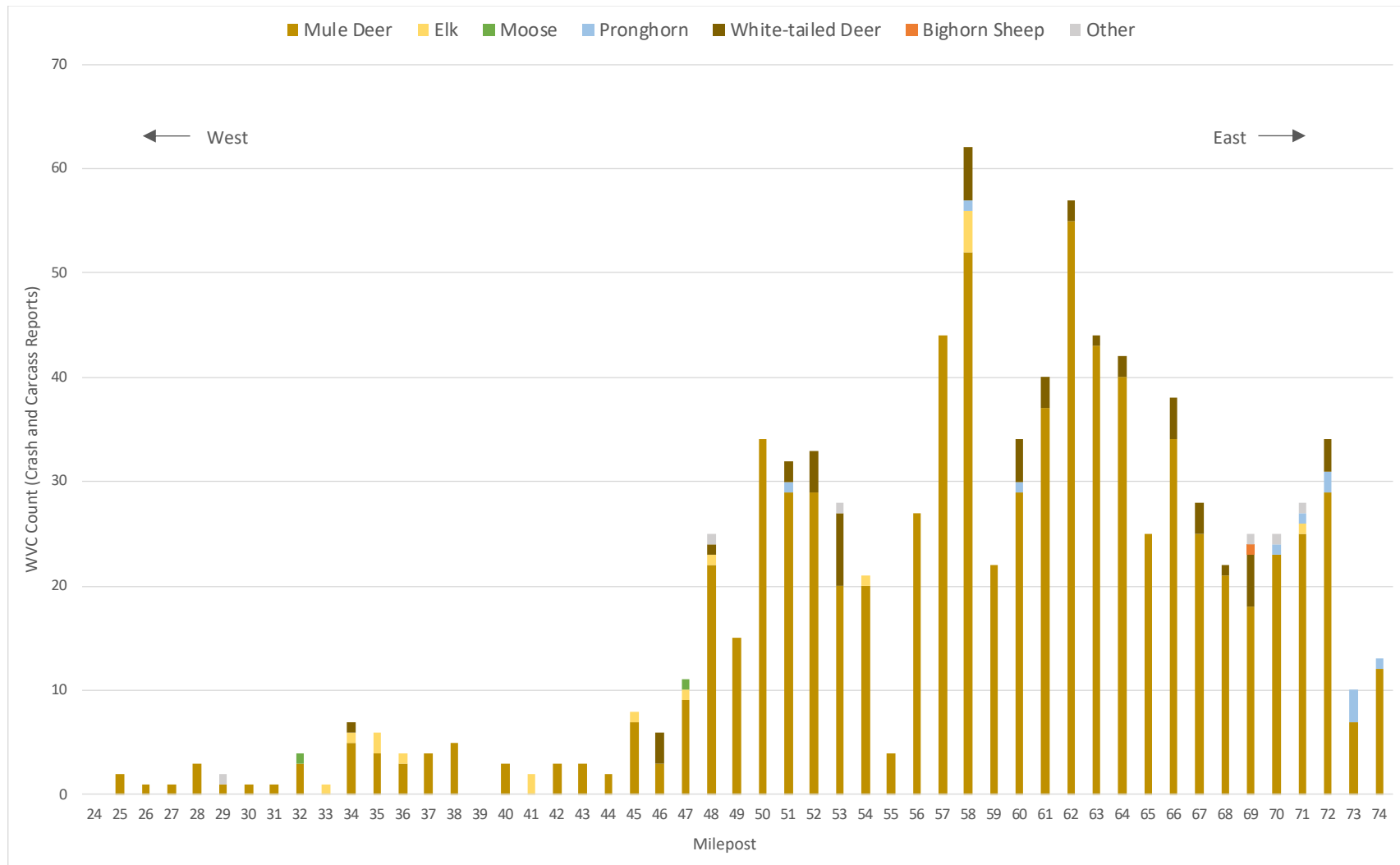


Figure 7. WVC crashes and carcass reports by species and by milepost (2015-2019). Dubois is between MP 54-56; Stony Point is at MP 49; and summit of Togwotee Pass is around MP 26.

Most WVCs involving mule deer occur during the fall and early winter (Fig 8). From 2015-2019, across the study area, WVCs are highest from October through March, with a large spike in November, corresponding with the arrival of migratory mule deer on winter range and rutting season, during which both buck and doe movements into the highway are less predictable. WVC are lowest during the summer months, reflecting the lower concentration of resident animals present year-round. In the higher elevation western portion of the study area, around Togwotee Pass, collisions with mule deer are restricted to the late spring through early fall (May – October), when deer are migrating or present on summer range.

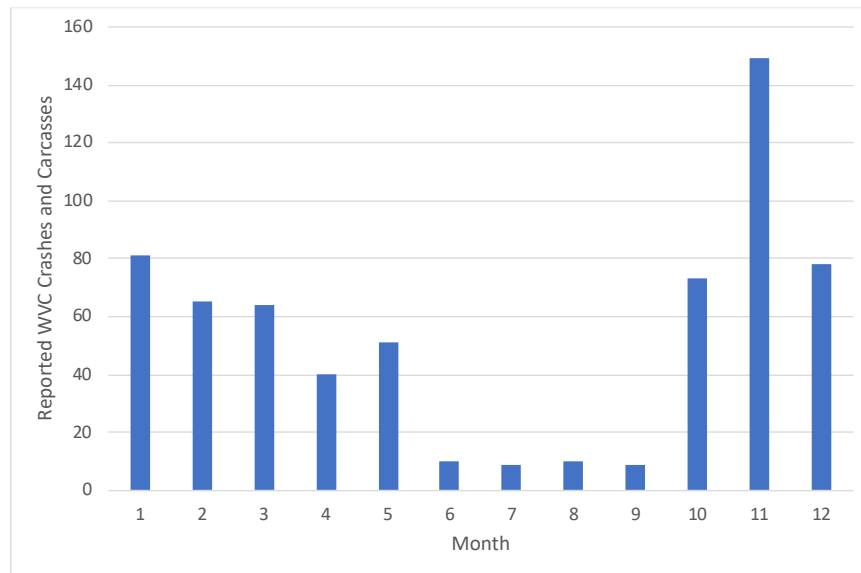


Figure 8. Total number of WVC in the study area involving deer by month of the year from 2015 through 2019.

# MITIGATION STRATEGY FOR US 26

## MITIGATION ASSESSMENT OBJECTIVES AND APPROACH

The objective of the mitigation assessment was to compile and evaluate wildlife habitat and movement data, WVC datasets, and other information to inform the development of cost-effective mitigation solutions for reducing WVCs, improving driver safety, and maintaining permeability for wildlife movement across US 26 from mileposts (MP) 24-73. The study area was divided into seven segments defined by similar land use, ownership, and wildlife use of the landscape (Fig. 9). The development of a mitigation strategy for this corridor was iterative and included multiple site visits, reviews, and refinements based on input from the project partners, and a public review and comment process. The resulting mitigation strategy outlines a common vision that identifies and prioritizes important wildlife movement areas and wildlife-highway conflict zones on US 26 around Dubois, with site-specific mitigation recommendations identified in each segment.

The mitigation assessment was conducted in the following steps:

1. Biological assessment based on available data and expertise, including wildlife habitat and collar data, spatial and temporal analysis of wildlife-vehicle collisions (based on crash data and carcass reports), traffic volumes, speed limits, and land use, and land ownership data.
2. Site assessment to evaluate wildlife movement patterns and potential mitigation strategies along the study corridor based on wildlife habitat, local WVC patterns, land ownership and land use, and terrain relative to the roadway. The site assessment included:
  - An analysis of deer movement patterns relative to the highway, including features that promote or inhibit movement, and the identification of major crossing zones and highway conflict areas.
  - A survey of existing roadway infrastructure, including bridges, stock passes, and other culverts. These were evaluated for their potential to function as crossing structures for mule deer and other wildlife using methods described in Kintsch and Cramer 2011. See [Appendix A](#) for a list of surveyed locations and the evaluation of a structure's potential functionality for deer and other wildlife passage.
  - A review of potential mitigation strategies in each study area segment, such as wildlife crossing structures, enhancements to existing transportation infrastructure, right-of-way fence removal or replacement, vegetation removal, signage, and other strategies.
  - The identification of additional opportunities and challenges for implementing different types of mitigation along the study corridor, such as landowner concerns or creating new barriers to wildlife movement that could inadvertently decrease permeability.
3. General recommendations applicable to an entire segment and site-specific mitigation recommendations were developed for each study area segment. During this process, two adjacent segments were combined as similar mitigation strategies were recommended for both segments. Mitigation recommendations for each segment were based on wildlife movement needs, WVC rates, cost-effectiveness, implementation feasibility, and were informed by the latest research on wildlife connectivity and WVC reduction strategies used in other locations.



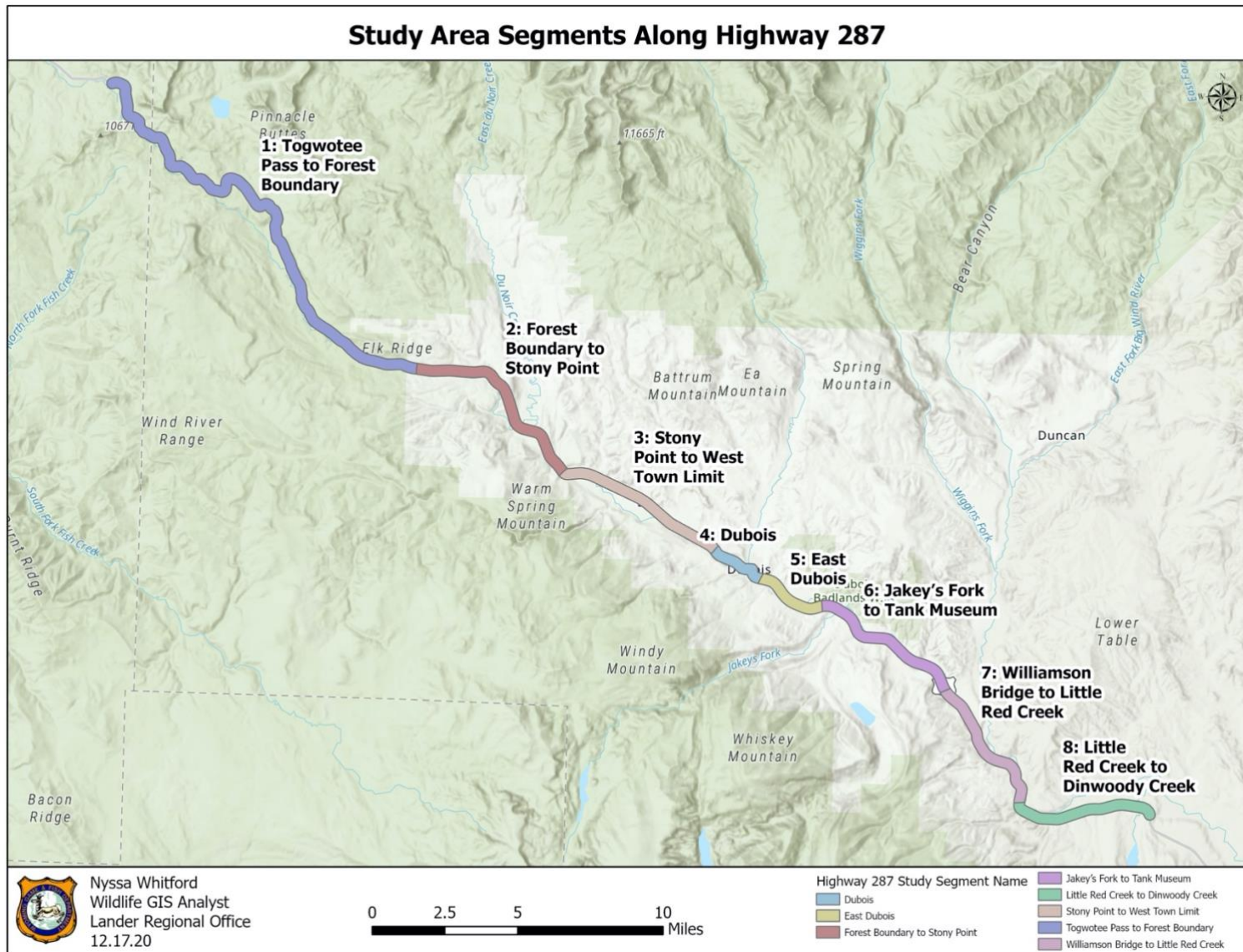


Figure 9. US 26 study area and mitigation segments.

4. Partner and public review and comment of mitigation recommendations was conducted throughout the assessment process, including two public meetings, which helped inform the development of mitigation recommendations. These reviews were essential in ensuring that the final mitigation strategy is feasible and reflects on-the-ground conditions while providing a comprehensive and cost-effective approach to reducing WVCs and maintaining wildlife movements and access to habitat along US 26.

#### *RIGHT-OF-WAY FENCE SURVEY*

Right-of-way fencing is present along both sides of US 26 throughout much of the study area. Fence types vary, often from one property line to the next. WYDOT conducted a survey of ROW fencing in the study area, identifying 14 different fence types. These fence types were then reclassified with respect to their permeability for wildlife, in particular mule deer and elk in order to evaluate the influence of ROW fencing on wildlife movement and WVC patterns. Table 1 lists the miles of fencing by fence type in the study area. As most of the lands in the fence survey are privately owned, both the majority of barrier fencing, and the majority of wildlife permeable fencing is on private lands. At the eastern extent of the study area, all of the fencing on the Wind River Reservation is either semi-permeable or wildlife permeable.

Table 1. Miles of each fence type in the study area. The fence survey was conducted on both sides of the highway from MP 47.6 to MP 70 and did not include the town of Dubois.

Fence Type	Description	Miles of Fence
Woven Wire Barrier Fence	Woven wire fence topped with one or more barbed strands	9.8
Other Barrier Fence	Includes buck and rail fence, 8'-high privacy fence, and other high or impenetrable fence types	1.4
Semi-permeable Fence	3 or 4-strand barbed wire fence	10.1
Wildlife Permeable	2 or 3-strand barbed wire fence with smooth bottom wire raised 16" off the ground; some with wood top rail	17.8
No fence	No right-of-way fence	23.1

#### *PUBLIC OUTREACH AND PARTICIPATION*

Two public meetings were held during the development of the mitigation strategy, in December 2020 and April 2021. The goal of the December 2020 meeting was to follow up on a previous public meeting in 2017, where the issue of WVCs on US 26 was discussed and to present the development of a mitigation strategy as the next step towards addressing this issue. The project team established the need for a mitigation strategy to proactively identify how targeted mitigation investments can have the

greatest impact on reducing WVCs while maintaining wildlife connectivity. The project team presented initial findings and concepts and solicited public feedback.

The second public meeting was held in April 2021, following the development of the draft mitigation strategy. The goal of this meeting was to present the detailed mitigation strategy and solicit feedback for incorporation into the final mitigation strategy.

Public comments and responses to these comments from both meetings are presented in [Appendix B](#).

#### *REVIEW OF POTENTIAL MITIGATION MEASURES*

A variety of wildlife-highway mitigation measures were discussed at both the December 2017 and the December 2020 public meetings and were further evaluated by the project team (Table 2).

Table 2. Summary of mitigation measures, their effectiveness, use and relative cost, and potential application for US 26.

Mitigation Measure	Effectiveness	Cost	Previous Use on US 26 or Elsewhere in Wyoming	Recommended Application for US 26
<b>SIGNAGE AND SPEED LIMITS</b>				
Reduce speed limit	Low. May result in small reductions in speed but no associated decrease in WVC	\$	Very low feasibility. Speed limits are set in statute.	Not recommended
Seasonal night-time reduced speed limits	Low, requires enforcement. May result in small reductions in speed but no associated decrease in WVC	\$	Night-time speed limits tested in 2019 WY research study – determined ineffective for preventing WVC.	Being evaluated for targeted areas
Variable Message Signs (VMS)	Low-Medium. VMS most effective along short stretches of roadway, during targeted timeframes, and with unique messaging	\$\$	Portable VMS were used seasonally throughout winter 2019/20.	Recommend continued seasonal use in key locations (e.g., for bighorn sheep at Little Red Creek Canyon)
<b>ROADSIDE MITIGATION AND DETERRENTS</b>				
Roadside vegetation management	Low-Medium. Includes regular mowing and vegetation clearing; use of unpalatable seed mixes to detract wildlife and improve driver sight lines	\$\$	WYDOT generally uses unpalatable seed mixes for revegetating the right-of-way.	Recommend targeted vegetation clearing in right-of-way and coordination with landowners
Reflectors & other visual or noise deterrents	Low-Variable effectiveness. Wildlife habituate to light and noise deterrents, reducing effectiveness over time.	\$	Wildlife warning reflectors were installed and tested on US 20 around Thermopolis and between Basin and Greybull.	Not recommended
Deicers that are unappealing to wildlife	Medium, but alternative deicers use a higher concentration of sand and may have other consequences, such as sediment loading in creeks and rivers.	\$\$	Yes, including in the study area, between ~MP 69.4-70.5. Requires switching deicer mix for specific areas.	Recommended in targeted areas to reduce collisions with bighorn sheep

Mitigation Measure	Effectiveness	Cost	Previous Use on US 26 or Elsewhere in Wyoming	Recommended Application for US 26
Increase wildlife attractants (habitat, water sources) away from the roadway	Potential effectiveness if motivation to cross roadway can be eliminated. Not recommended for migratory movements.	\$\$	Experimental testing of sagebrush mowing to increase herbaceous and shrub forage values outside of the ROW began in fall 2020 on US 189 south of Big Piney.	Recommend exploring implementation of enhanced water source on south side of US 26 in Little Red Creek.
Replace right-of-way fencing with wildlife permeable alternative and/or install gates or sections lay-down fence that are opened during peak movement periods	Medium effectiveness. Permeable fencing increases the probability of a successful fence crossing and reduces the time it takes for animals to cross a fence (Segar and Keane 2020) and the time exposed to potential WVC.	\$\$	Installed on WY 28 and WY 351 in addition to paired gates that are opened during peak movement periods. Also installing wildlife permeable fence in the project area between MP 56.5 – 68.	Highly recommended in targeted areas
Roadway Lighting to improve visibility for drivers of animals on or approaching the road.	Medium-Low. Lighting is most effective where driver speeds are already low and most feasible where lighting may be tied into existing lighting systems.	\$\$	Lighting added at Daniel Junction on US 191 helped to reduce collisions with deer.	Recommended within the town of Dubois
<b>WILDLIFE CROSSINGS AND WILDLIFE-EXCLUSION FENCING</b>				
Overpass or Underpass with Fencing (including escape ramps and wildlife guards)	High effectiveness, well designed crossing structures can result in ≥81% reduction in WVC and high passage rates, especially for mule deer (e.g. Kintsch et al. 2021; Sawyer and Rodgers 2015).	\$\$\$\$	Wildlife overpasses and underpasses have been successfully implemented in multiple locations in the state.	Highly recommended in targeted areas
Add wildlife exclusion fencing to existing bridges and culverts to direct wildlife to cross through these structures	High effectiveness in reducing WVC and promoting wildlife passage (Donaldson and Elliott 2020) where there are existing structures that are functional or can be retrofit.	\$\$	Planned on I-25 near Kaycee once funding is secured.	Highly recommended in targeted areas



Mitigation Measure	Effectiveness	Cost	Previous Use on US 26 or Elsewhere in Wyoming	Recommended Application for US 26
Alternating High-Low Fence Segments including escape ramps and wildlife guards) to direct wildlife to cross in locations with better visibility for drivers	Experimental. Testing to begin in CO in 2022	\$	No	May be recommended in select areas
<b>DRIVER WARNING SYSTEMS</b>				
Continuous animal detection system (ADS) and driver warning signs	Low-Variable, depending on the system type. Evolving technologies are still experimental	\$\$\$\$	An ADS tested in Nugget Canyon was found to be ineffective (2000-2001).	Not recommended
Wildlife Crosswalk	Variable, depending on the system type. Short detection and driver warning zone is more effective than a continuous zone	\$\$\$	No	Not recommended
<b>PUBLIC EDUCATION AND OUTREACH</b>				
Public Outreach Campaigns	Very difficult to gauge direct impact but considered an important component of a comprehensive mitigation strategy	\$	Yes, including a 2019 public meeting for US 26.	Recommended in conjunction with other components of the US 26 mitigation strategy

## MITIGATION SEGMENTS AND MITIGATION RECOMMENDATIONS FOR US 26

Mitigation recommendations were developed for each of the seven study area segments. Mitigation recommendations for each segment were based on wildlife movement patterns and needs, WVC rates (Fig. 10), land use, terrain, cost-effectiveness, and implementation feasibility, and were informed by the latest research on wildlife connectivity and WVC reduction strategies used in other locations. Several high priority segments were identified based on the need for mitigation in areas with high concentrations of wildlife and high WVC.

The following sections review each of the study area segments from west to east. Segments 3 and 6 were identified as the highest priorities for reducing WVC and maintaining permeability for wildlife (bolded).

- Segment 1 – Togwotee Pass to Forest Boundary, MP 24-41
- Segment 2 – Forest Boundary to Stony Point, MP 41-48
- **Segment 3 – Stony Point to West Town Limit, MP 48-54**
- Segment 4 – Dubois, MP 54-56
- Segment 5 – East Dubois, MP 56-58
- **Segment 6 – Longhorn Ranch to Military Vehicles Museum, MP 58-64**
- Segment 7 – Military Vehicles Museum to Little Red Creek, MP 64-69
- Segment 8 – Little Red Creek to Dinwoody Creek, MP 69-74

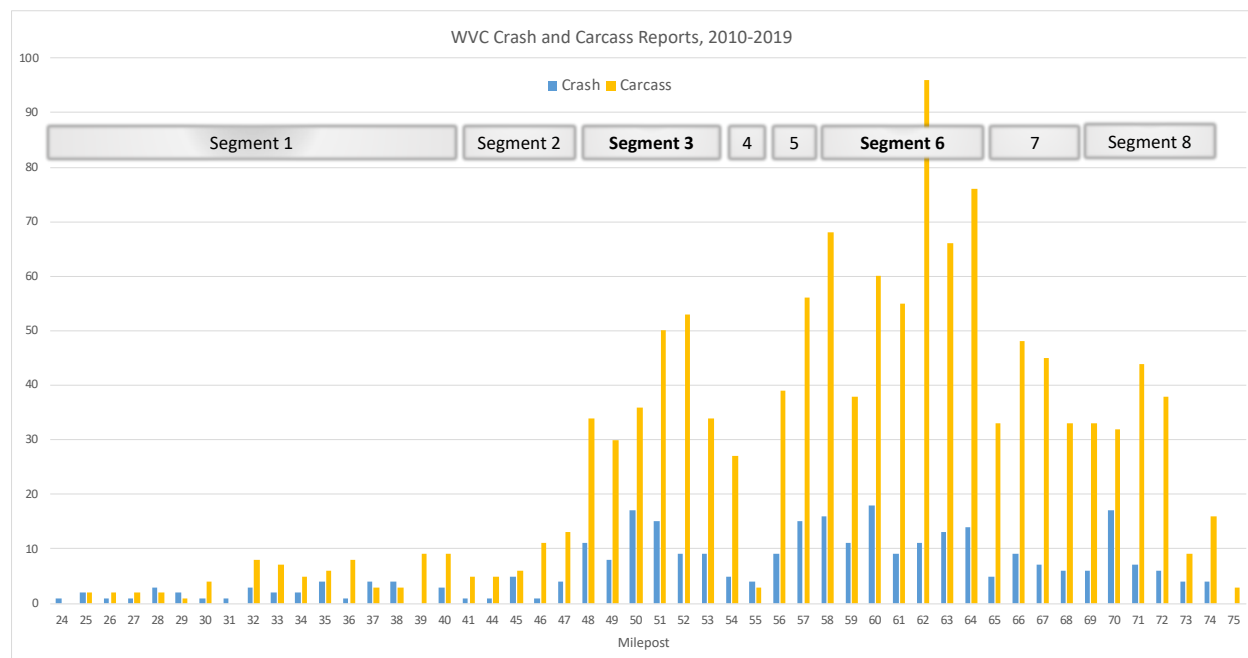


Figure 10. WVC crash and carcass reports per mile overlaid with the seven mitigation segments.

### **SEGMENT 1: MILEPOST 24 – 41, TOGWOTEE PASS TO FOREST BOUNDARY**

This segment encompasses the western end of the study area and lies within the Shoshone and Bridger-Teton National Forests with limited private inholdings along the roadway. The higher elevation, forested habitat provides important summer range for mule deer, elk and other wildlife, and is part of a migration route for animals that summer farther west in the northern Gros Ventre Range east of Jackson and Grand Teton National Park.

Throughout this segment, WVC rates are low at 0.5 WVC crashes and carcass reports per mile per year, with the majority of collisions occurring in the early summer months. Mule deer collar data indicate the majority of cross-highway movements by migratory deer occur around MP 34, near Lava Mountain Lodge. WVC rates are slightly higher in the eastern portion of Segment 1 (MP 32-41) relative to the western portion of the segment (MP 24-31). There is no right-of-way (ROW) fencing through the National Forest, which promotes the free movement of wildlife across the road, except where private lands abut the highway. The low WVC rate is also, in part, due to the time of migration movements across US 26 during the fall months, when traffic volumes have fallen from their peak levels during the summer tourist season. In addition to mule deer, several moose-vehicle collisions were recently reported in this segment as well as a WVC involving a grizzly bear – all in the Brooks Lake area. Recent bear activity is a management concern and WGFD, the Forest Service, and Highway Patrol are collaborating to address roadside bear management.

The highway in this segment has already been widened and no new WYDOT projects are anticipated in this segment. There is one existing bridge at the far western end of this segment that is highly functional for deer and other wildlife passage. The bridge spans a tributary of Blackrock Creek that acts as a natural corridor for wildlife movement. On the south side of the bridge, a short stretch of buck and rail fence directs wildlife to the bridge; however, deer and other wildlife more frequently make at-grade road crossings in this area.

#### **Mitigation Recommendations:**

##### General Recommendations

- Continue ongoing vegetation mowing along roadway by WYDOT.
- Maintain existing permeability and monitor traffic volumes and WVC over time to determine future mitigation needs.

##### Site-Specific Recommendations

Milepost	Location Description	Mitigation Recommendation	Priority
<b>24.14</b>	Buried bridge over tributary of Blackrock Creek	Extend guard rail on north side of the highway ~175' to the east (to align with the retaining wall on the south side of US 26) and west (to align with the end of the guard rail on the south side of US 26 and the cut slope on the north side). Guard rail does not prevent deer and other wildlife from crossing a roadway but may help to discourage some at-grade crossings. Aligning guard rail	Low

		on both sides of roadway may prevent animals (in particular does with fawns) from becoming partially trapped on the roadway and increasing exposure to potential WVC.	
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## **SEGMENT 2: MILEPOST 41 – 48, FOREST BOUNDARY TO STONY POINT**

This segment is largely comprised of private lands along the roadway. The habitat in this area is important primarily for migratory deer, although other wildlife is also common – a local elk herd that is known to cross back and forth across the highway and moose interactions with the highway are most common around MP 46. WVCs are low (1.3 WVCs per mile per year), with increasing rates of WVCs recorded at the eastern end of the segment, between MP 47-48. Woven wire and barbed wire ROW fences are present through much of the segment.

Existing bridges in this segment have high potential functionality for deer and other wildlife passage, although ROW and other fencing (e.g., horse corral) adjacent to these bridges restricts wildlife movements through several of the bridges. At MP 46.43, there are gaps in the ROW fencing along the riparian corridor and wildlife have created a trail through these gaps and under the bridge (Fig. 11). A large (10'W x 10'H) box culvert at MP 44.66 is located within BLM lands on either side of the structure. This culvert has high potential functionality for deer; elk are likely to use a structure of these dimensions in a more limited fashion, as solitary animals, pairs or small groups, and the structure may not provide passage for cows with calves.



Figure 11. Game trail through gap in wildlife fence at the bridge over the Wind River at MP 46.43.

In 2021, WYDOT is replacing approximately five miles of ROW fence in this segment on both sides of the highway from MP 40.6 – 45.66. The majority (91%) of the replacement fence will be wildlife permeable and the remainder 5-strand barbed wire.

### **Mitigation Recommendations:**

#### General Recommendations

- Over the long term, if barriers to wildlife movement increase or WVCs increase, consider installing short sections of wildlife exclusion fence (~0.5 mile in either direction from a structure) at all or some of the existing bridges and the box culvert to encourage wildlife use of these structures and discourage at-grade highway crossings. Fence ends should be clearly signed and located in areas with good visibility for motorists and should be designed to minimize wildlife incursions into the fenced ROW.



### Site-Specific Recommendations

Milepost	Location Description	Mitigation Recommendation	Priority
<b>43.38</b>	Long Creek bridge	Create wildlife pathways through the riprap and vegetation underneath the bridge on either side of the creek. This location is included in WYDOT's 2021 ROW fence replacement project – the new ROW fence around this bridge will be wildlife permeable on the north side and 5-strand barbed wire on the south side. Coordinate with adjacent landowners to improve wildlife access to the bridge, for example by installing sections of lay-down fence to provide opening during periods of peak wildlife activity.	Medium
<b>44.6</b>	10'W x10'H box culvert	Maintain structure for wildlife passage. This location is included in WYDOT's 2021 ROW fence replacement project – the new ROW fence through this area will be wildlife permeable on both sides of US 26.	High
<b>45.66</b>	Wind River bridge	Create wildlife pathways leading to and underneath the bridge on the east side of the river. WYDOT's 2021 ROW fence replacement project terminates on the west side of this bridge; the new fence on the west side of the bridge will be 5-strand barbed wire.	Medium
<b>46.43</b>	Wind River bridge	Retain gaps in ROW fence and clear vegetation as needed to maintain wildlife pathways on both sides of the river.	Medium

### **SEGMENT 3: MILEPOST 48 – 54, STONY POINT TO WEST CITY LIMITS**

*\*This segment is a high priority for mitigation implementation in the US 26 study area*

This segment is largely comprised of private lands along US 26. Irrigated fields and haystacks in this segment attract wildlife and increase wildlife movements across the highway and the potential for WVC. A variety of different fence types are in use though this segment, often changing at property lines (Fig. 14, next page). The majority of the ROW fence in this segment is woven wire or other fencing that presents a near-complete barrier to wildlife movement, in particular fawns and calves (Fig. 12). ROW fences in this segment can act as an impediment to wildlife movement and increase the time animals spend in the roadway as they attempt a crossing, leading to increased WVCs.

Wildlife permeable fence is present only in the far western portion of the segment (MP 48-49). In this area, wildlife permeable fencing is present on both sides of the highway, reducing the likelihood of wildlife becoming trapped inside the ROW and their exposure to WVC. Correspondingly, this portion of the segment has the lowest WVC rate (Fig. 14, inset graph).

In addition to the ROW fencing, between MP 50-54, there is an irrigation ditch that runs parallel to the highway. Along much of its length, the ditch is concrete lined and several feet wide. In many places the ditch is immediately adjacent to the ROW fence, creating an even larger impediment to wildlife movements (Fig. 13). Shrubby vegetation adjacent to US 26 provides cover for wildlife approaching the road, adding a surprise element and reducing motorists' ability to detect approaching wildlife and slow down. Prominent visual obstructions in this segment were mapped by WGFD in fall 2020.

Wildlife-vehicle collisions occur at a rate of 5.5 WVC per mile per year in this segment. The highway is flat and runs straight through this segment, generally offering drivers good sight lines. Still, the high concentration of deer and other wildlife in this portion of the study area, in conjunction with the ROW fencing and vegetation cover adjacent to the highway where approaching wildlife can surprise motorists all contribute to the high frequency of WVC. WVC occur year-round, but are highest in the fall, winter, and spring months, and a spike in conjunction with the fall migration in October and November.



Figure 13. Example of woven wire fence and adjacent shrubby vegetation cover in Segment 3.



Figure 12. Concrete-lined irrigation ditch adjacent to the ROW fence, which, in conjunction, create a barrier for wildlife.

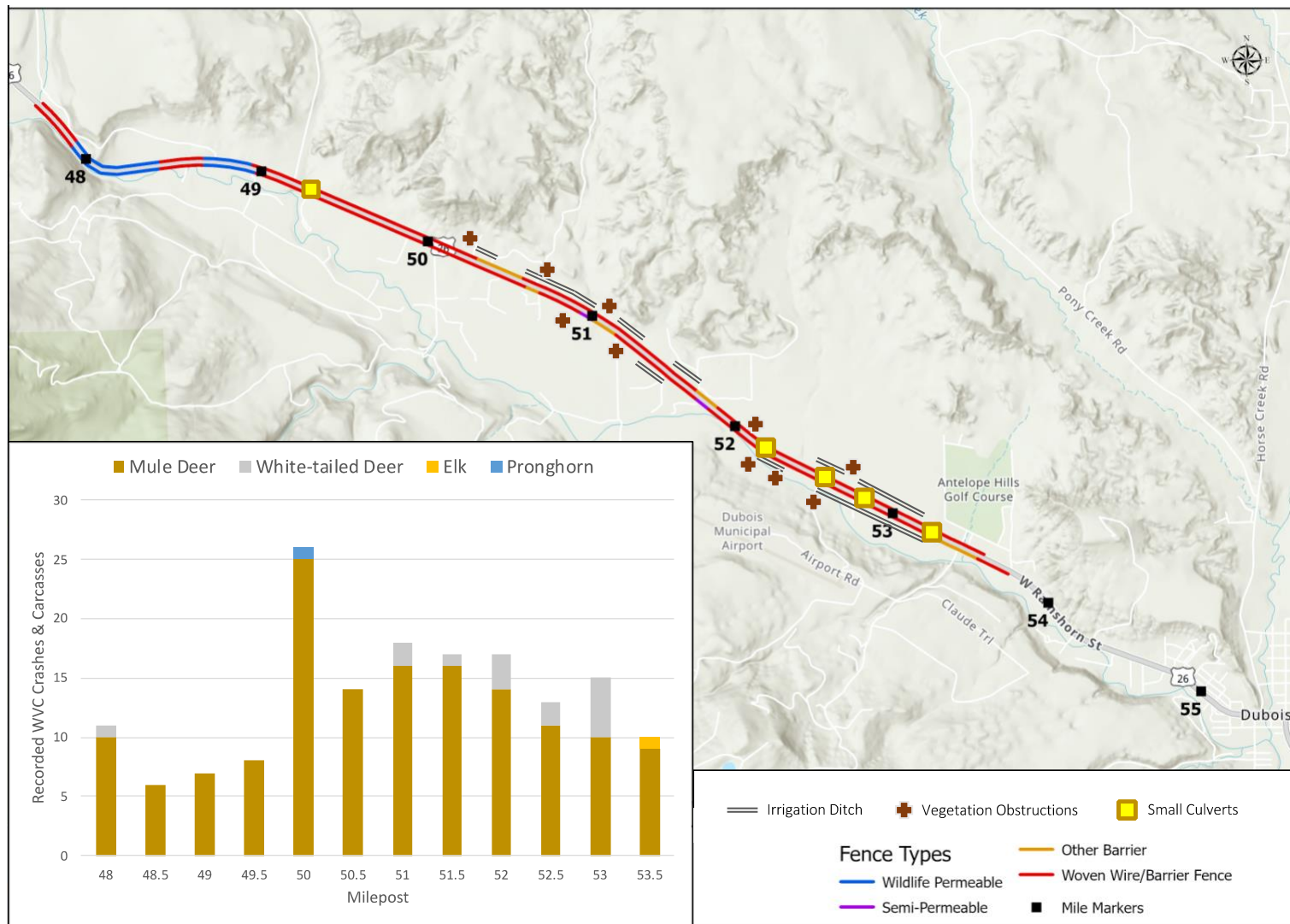


Figure 14. Right-of -way fence types, small culverts (stock passes with some potential functionality for wildlife passage), irrigation ditch parallel to US 26 and roadside vegetation obstructions in Segment 3, West of Dubois (MP 48-54). Inset graph depicts wildlife-vehicle collisions by half-mile through the segment.

There are several medium-sized culverts (7-10') in this segment that offer potential functionality for wildlife passage. Most of these culverts are actively used stock passes, and in several cases, gates or fencing immediately in front of a culvert entrance prevents wildlife access to the culvert. In addition, domestic animal activity may limit functionality for wildlife.

## **Mitigation Recommendations:**

### General Recommendations

- Coordinate with landowners to identify targeted areas where the ROW fencing may be replaced with wildlife permeable fence types on both sides of the highway. Focus initial efforts between MP 50-53.
- Regarding the irrigation ditch between MP 50-54:
  - Coordinate with NRCS to determine whether inactive portions of the ditch may be removed or replaced with a pipe in berm. In some places the ditch does provide water for downstream uses.
- WGFD coordinate with landowners to move haystacks away from the highway and install high fence around them to reduce wildlife attractants near US 26.
- Coordinate with landowners to remove visual obstructions on private lands that may interfere with motorists' ability to detect approaching wildlife.
- Identify opportunities to coordinate with landowners in areas where forage improvements could help keep wildlife on one side of the highway and lessen the need for them to move back and forth across the highway.
- Consider installing dual speed limit signs from October through May. This technology is currently being tested near Cody; if it is determined to be sufficiently reliable and can be shown to help decrease WVC, then it may offer a complementary mitigation option for this segment.

### Site-Specific Recommendations

- Coordinate with landowners at five small culvert locations to explore opportunities for improving functionality for wildlife passage, including relocating gates and fencing away from the culvert entrances to permit wildlife access and prevent domestic animal access to the culverts except when livestock are being moved from one pasture to another. Where culverts are improved for wildlife passage, retain existing wildlife ROW fence types for approximately one to two-tenths mile in either direction of the culvert.
  - The five culvert locations are: MP 49.3; MP 52.04; MP 52.48; MP 52.78; MP 53.3 (see [Appendix A](#) for location details)

**SEGMENT 4: MILEPOST 54 – 56, DUBOIS**

Segment 4 is defined by the town of Dubois. Despite low in-town speed limits (30mph), WVC continue to occur in this segment at a rate of 1.6 WVC per mile per year.

**Mitigation Recommendations:**General Recommendations

- Approach the town of Dubois about partnering to improve roadway lighting by converting the existing lighting to LED and expanding the roadway lighting east to approximately MP 56.5.
- Coordinate with the town to continue discouraging feeding of deer.

Site-Specific Recommendations

- There are no site-specific mitigation recommendations in this segment.



### **SEGMENT 5: MILEPOST 56 – 58, EAST DUBOIS**

This segment encompasses the eastern end of the town of Dubois, including residences, commercial and industrial development, including a gravel pit. Despite the high level of development and human activity along US 26 through this segment, there were 93 recorded deer-vehicle collisions in this segment over a five-year period (2015-2019). With a rate of 9.3 WVC per mile per year, this segment has the highest WVC rate in the study area.

There are several existing structures in this segment with the potential to pass deer and other wildlife. These include a bridge over the Wind River and two stock passes.

#### **Mitigation Recommendations:**

##### General Recommendations

With a high WVC rate and several existing structures that could be improved for wildlife passage, a mitigation solution involving crossing structures and wildlife fencing is warranted in this segment. However, such structural mitigation is complicated by commercial and residential development along US 26. Wildlife guards would be needed at every driveway and access road and while these mitigation features are important in helping to prevent wildlife incursions into a fenced highway, they are not 100% effective. With such a large number of wildlife guards required in this two-mile segment (~17), the overall effectiveness of the mitigation investment would be reduced, and risk animals becoming trapped inside the fenced ROW. For these reasons, for this type of mitigation in this segment at this time.

Wildlife-permeable ROW fence was installed along much of the segment in 2020. This fence replacement is expected to reduce the roadside barriers to wildlife movement and may help to reduce WVCs. The removal of roadside vegetation that can obstruct motorist visibility of approaching wildlife is also recommended and should be pursued in coordination with landowners.

##### Site-Specific Recommendations

While wildlife exclusion fencing is not recommended for this segment at this time, increasing wildlife access and the functionality of the existing structures in this segment for wildlife passage may help to encourage wildlife use of these structures and decrease at-grade wildlife movements.

Milepost	Location Description	Mitigation Recommendation	Priority
<b>56.97</b>	Wind River bridge	Coordinate with adjacent landowners to improve wildlife access to bridge and enhance wildlife paths on both sides of the river.	Medium
<b>57.17</b>	11'6"W x 7'H corrugated metal arch culvert	Coordinate with adjacent landowners to replace setback fencing and gates from culvert entrances and replace the gate on the south side with a wildlife permeable alternative. Add natural substrate to culvert floor.	Medium
<b>57.5</b>	7'5" diameter corrugated metal pipe culvert	Maintain functionality for wildlife, including sediment through the bottom of the culvert.	Medium

## SEGMENT 6: MILEPOST 58 – 64.5, LONGHORN RANCH TO MILITARY VEHICLES MUSEUM

*\*This segment is a high priority for mitigation implementation in the US 26 study area*

This segment is comprised primarily of agricultural and pasture lands with some residential development, particularly around Red Hills. There are several large ranches with conservation easements between the South Fork of Torrey Creek and the Military Vehicles Museum (~MP 60.6-64) on the south side of the highway. With an annual average of 8.7 WVCs per mile per year, this segment has the second highest rate of WVC in the study area, including the mile segment with the highest peak in WVC at MP 61/61.5 (Fig. 15).

This segment is in the heart of mule deer winter range. Irrigated fields on either side of US 26 and the Wind River are attractants for wildlife arriving on winter range. During the fall and early winter in particular, mule deer make daily movements across US 26, prior to settling into winter range in the adjacent hills on either side of the valley. Correspondingly, 51% of all WVCs in this segment occur during the three-month period of November through January. Few WVCs occur during the summer months (7%), with the remainder recorded in the spring and fall.

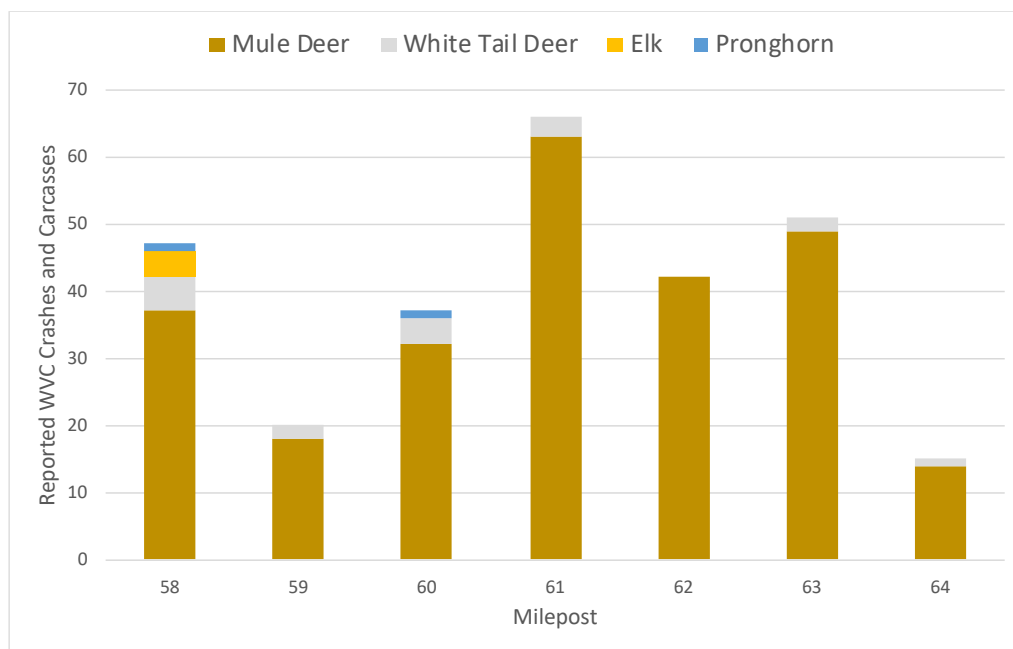


Figure 14. Reported WVC crashes and carcasses in Segment 6 from 2015-2019. MP 58 is at Longhorn Ranch/Kingfisher Road, east of Dubois; Red Hills Road is a MP 61.5, and MP 64 is adjacent to the Military Vehicles Museum. Note, only ½ mile of MP 64 is included in this segment.

There are a number of existing bridges and culverts in this segment, many of which are potentially functional for wildlife passage (see [Appendix A](#)). Enhancements to this existing infrastructure offers a major opportunity for WVC mitigation efforts in this segment. ROW fencing is present throughout the

segment, but unlike the fencing west of Dubois (Segment 3), much of the ROW fencing in this segment is permeable or semi-permeable to wildlife.

## **Mitigation Recommendations:**

### General Recommendations

Due to the high rate of WVCs and the presence of several existing large bridges and culverts with potential functionality for wildlife passage, this segment is recommended for a comprehensive system of wildlife crossings and fencing mitigation. While costly, this type of mitigation has a demonstrated effectiveness, and it is expected that these investments in this segment would have a major impact on reducing WVCs while maintaining connectivity for wildlife.

### Site-Specific Recommendations

Potential locations for new wildlife crossing structures (Fig. 15) were evaluated based on several considerations, 1) building off of the existing infrastructure and optimizing spacing such that wildlife have an opportunity to cross US 26 every 1-2 miles; 2) land use compatibility; and 3) terrain and construction feasibility. For this mitigation assessment, WYDOT conducted preliminary engineering reviews of four potential crossing structure locations, three of which were deemed potentially feasible. The proposed structure dimensions are preliminary estimates that will be refined through future design processes; for example, structures that are shorter may not be as wide for wildlife to pass successfully. Alternative locations may also be feasible and should continue to be evaluated for the greatest benefit to wildlife and cost-effectiveness. The following table lists recommendations for enhancing wildlife passage at existing bridges and culverts as well as recommendations for new wildlife crossing structures (light gray rows). Eight-foot-high wildlife fencing connecting the existing and new structures would guide animals to these safe crossing locations and help to prevent WVC on US 26, extending from the Wind River bridge near the east end of Dubois (MP 56.97) to east of the Military Vehicles Tank Museum (MP 64.1). The east fence end should be sited and designed to discourage from entering into the fenced ROW and at a location with good visibility for motorists to prevent a spike in WVC at the fence end. In Arizona, a wildlife crosswalk and driver warning system installed at a fence end was successful in meeting these objectives (Gagnon et al. 2018).



Figure 15. Example of a wildlife overpass on State Highway 9 in Colorado. This system of 7 wildlife crossing structures and wildlife fencing along 10.3 miles of highway was successful in reducing WVCs by over 90%. Credit: J. Richter

Milepost	Location Description	Mitigation Recommendation	Priority
<b>58.6</b>	Fill slope adjacent to Wind River oxbow	Construct an arch underpass approximately 40-50'W x 14'H x 140-170'L (depending on culvert skew). Excavation will be required at the south culvert entrance; to lessen the amount of excavation and grading needed, the culvert can be skewed. Alternatively, a wildlife overpass could be constructed at a cut slope adjacent to this location.	High
<b>59.2</b>	Jakey's Fork bridge	Clear pathways through riparian vegetation along both riverbanks	High
<b>59.5</b>	Cut slope at top of hill	Construct an overpass approximately 100'W x 75'L. The topography at this location lends itself to a wildlife overpass. Overpasses can be highly functional for a variety of wildlife including elk, pronghorn, and large herds of deer.	High
<b>59.95</b>	11'6"W x 7'H corrugated metal arch culvert	Maintain functionality for wildlife, including sediment through the bottom of the culvert.	High
<b>60.41</b>	South Fork Torrey Creek bridge	Create wildlife pathways under the bridge through the riprap and vegetation.	High
<b>61.5</b>	Small fill slope near Red Hills Road	Construct an arch or box culvert approximately 30'W x 10'H x 120'L. Some excavation will be required at the south culvert entrance to achieve this culvert opening.	High
<b>62.9</b>		Construct an arch underpass approximately 30-40'W x 14'H x 140-160'L (depending on culvert skew). Some excavation will be required at the south culvert entrance; to lessen the amount of excavation and grading needed, the culvert can be skewed. A crossing structure at this location will require coordination with the adjacent river access to minimize wildlife disturbance at the crossing structure.	High
<b>63.7</b>	Wind River bridge	Coordinate with adjacent landowners to improve wildlife access to bridge, remove old fencing, and enhance wildlife paths on both sides of the river.	High

Wildlife guards at interchanges and driveways as well as escape ramps are important components of a wildlife crossing system with continuous fencing. These mitigation features help prevent wildlife breaches into the fenced ROW and offer an escape route when animals do become trapped inside the fence. Wildlife guards must be installed at all road and driveway access points. Wildlife guards are specialized double cattle guards designed to prevent hooved animals from walking across and are too long for animals to jump and have been shown to be  $\geq 80\%$  effective in preventing deer, elk, and other ungulates from entering into a fenced ROW (Flower 2016; Kintsch et al. 2021). In some locations with low levels of use, such as field access points, tall gates may be used instead of wildlife guards, provided that the gates remain closed except when in use. Areas with a high number of driveway access points complicate the fence alignment and increase the number of wildlife guards needed; these

considerations will need to be addressed in the next phase of design and implementation of this mitigation strategy.

With the construction of 8'-high wildlife exclusion fence along the highway, wildlife must be able to access safe crossing locations at existing and new bridges and culverts. Lateral fencing demarking property lines and pasture boundaries can impede wildlife movements across the landscape, including access to crossing structures. Throughout this segment, fence lines on properties adjacent to US 26 run perpendicular to the ROW fence line and may impede wildlife movement to crossing structure locations. Information on fence locations will be used to identify areas where coordination with landowners is needed to ensure that fence lines on private properties do not prevent wildlife from accessing new or existing safe crossing locations, while protecting landowner needs.

A schematic of the mitigation concept for this segment is presented in Figure 16. While the recommended mitigation strategies have benefits throughout the segment, due to funding availability it is expected that mitigation construction would need to be phased and cannot be constructed all at once. At this time, the recommended phasing is to construct the western portion of the segment first, from Longhorn Ranch to Torrey Creek (MP 58-61.5), as this section involves fewer landowners and greater construction feasibility based on the terrain adjacent to the roadway. However, this phasing may be adjusted according to funding availability and other circumstances.



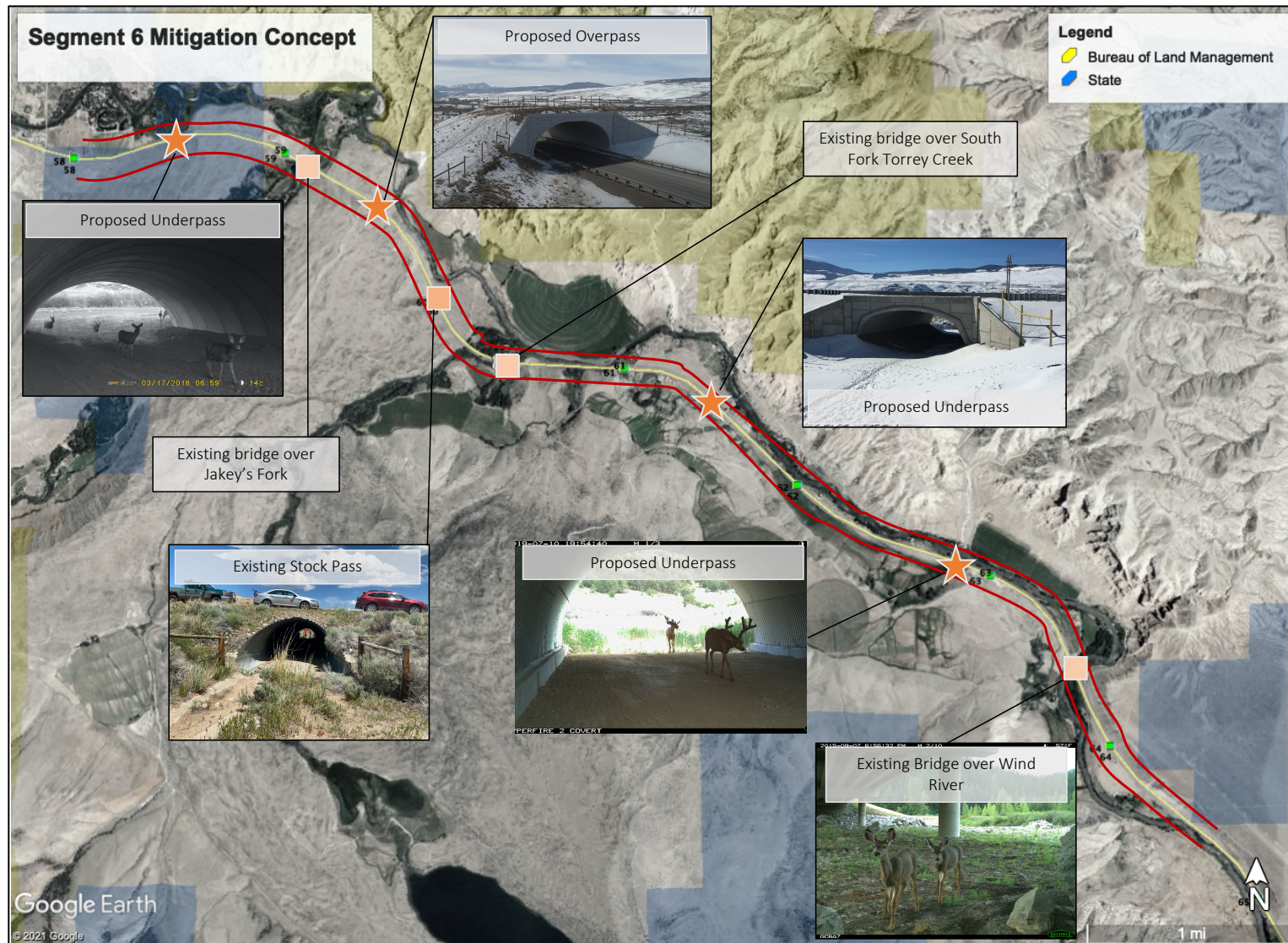


Figure 16. Mitigation concept for Segment 6, Longhorn Ranch to the Military Vehicles Museum (MP 58-64.5). Squares represent existing bridges or culverts that may be improved to promote wildlife passages; Stars indicate the locations of proposed new wildlife crossing structures; red lines indicate the extent of wildlife fencing.



### **SEGMENT 7: MILEPOST 64.5 – 69, MILITARY VEHICLES MUSEUM TO LITTLE RED CREEK**

While WVCs are lower in this segment than in Segment 5, WVCs still occur at a rate of 5.5 WVC per mile per year. Irrigated fields as well as the river corridor itself attract wildlife, resulting in deer movements back and forth across US 26. These movements may be influenced by agricultural practices, for example, in one case, a newly irrigated field may be helping to decrease wildlife activity on the highway as more animals remain in and around the field with less of a need to move back and forth across the highway. On the other hand, such practices may entice wildlife to cross the highway to access fields and pasture with improved forage. The roadway through this segment is mostly straight with little tree or shrub cover adjacent to the highway. These conditions ought to offer good sight lines for motorists to detect and be able to respond to wildlife that may be approaching the roadway, but due to the magnitude of deer activity in this segment, WVCs remain frequent.

There are few existing bridges or culverts in this segment. However, a long span bridge across the Wind River at MP 66.91 offers high potential functionality for wildlife passage. The ROW fence around this area is an elk-post/top-rail variety with a smooth bottom wire 16" above the ground level and a wood rail across the top that makes the top of the fence much more visible for wildlife jumping over the fence and reduces the likelihood of leg entanglement (Fig. 17).



Figure 17. Wildlife permeable elk-post fence in Segment 7.

#### **Mitigation Recommendations:**

##### General Recommendations

- Identify opportunities to coordinate with landowners in areas where forage improvements could help keep wildlife on one side of the highway and lessen the need for them to move back and forth across the highway.
- Continue to monitor WVC rates and, as technologies improve, evaluate this segment for a wildlife detection and driver warning system.

##### Site-Specific Recommendations

Milepost	Location Description	Mitigation Recommendation	Priority
<b>66.91</b>	Wind River bridge	Create pathways along both riverbanks through rocks and riparian vegetation and remove debris under bridge to improve wildlife access. Consider installing a short section of wildlife exclusion fence (~0.5 mile in either direction from a structure) to encourage wildlife use of the bridge and discourage at-grade highway crossings. Fence ends should be clearly signed and located in areas with good visibility for motorists and should be designed to minimize wildlife incursions into the fenced ROW.	Medium

### **SEGMENT 8: MILEPOST 69 – 73, LITTLE RED CREEK TO DINWOODY CREEK**

This segment is within the Wind River Reservation, although many of the properties immediately adjacent to the highway are privately owned. The Wind River and its associated riparian habitat runs parallel to the highway and serves as a wildlife attractant. Sagebrush habitat is interspersed with agricultural fields and pasture on both sides of the highway. Wildlife-vehicle collisions remain high through this segment, at a rate of 4.9 WVC per mile per year.

There are multiple bridges and culverts in this segment that have potential functionality for wildlife passage ([Appendix A](#)).

#### **Mitigation Recommendations:**

##### General Recommendations

- Coordinate with the Eastern Shoshone and Northern Arapaho Tribes to develop a long-term plan for improving habitat and making natural water sources on the south side of US 26 in Little Red Creek more available to wildlife to lessen the need for wildlife, in particular bighorn sheep, to cross US 26 to access the Wind River.
- Throughout the segment, replace barbed-wire ROW fencing with wildlife permeable fence.
- The following mitigation options are recommended for further evaluation in terms of feasibility, reliability, and benefit-cost:
  - Install short sections of wildlife exclusion fence (~0.5 mile in either direction from a structure) at existing bridges and culverts to encourage wildlife use of these structures and discourage at-grade highway crossings. Fence ends should be clearly signed and located in areas with good visibility for motorists and should be designed to minimize wildlife incursions into the fenced ROW.
  - Install a wildlife detection and driver warning system through the segment. Current technologies are expensive and insufficiently reliable; however, with ongoing testing, continued improvements, and increased cost efficiencies, this type of mitigation may become a viable alternative.

##### Site-Specific Recommendations

Milepost	Location Description	Mitigation Recommendation	Priority
<b>69.94</b>	Little Red Creek bridge	Create pathways for wildlife through the thick vegetation on either side of the bridge.	Medium
<b>70.49</b>	Red Creek bridge	Replace wire bank armoring and barbed wire fencing in front of the bridge entrances to improve wildlife passage.	Medium
<b>73.28</b>	Dinwoody Creek	Create pathways for wildlife through the thick riparian vegetation and replace barbed wire fencing in front of the bridge entrances to improve wildlife passage.	Medium

# NEXT STEPS

## PUBLIC ENGAGEMENT

Public involvement is essential for the implementation and success of the US 26 mitigation strategy. A second public meeting to receive feedback on the draft mitigation strategy will be held the evening of April 27, 2021 via Zoom. The partnership team will present key findings of the mitigation assessment and outline the major components of the mitigation strategy as described in this report.

Once this feedback has been incorporated and the mitigation strategy finalized, a suite of public outreach materials will be developed. The objectives of continued public engagement following the completion of this mitigation strategy are to: 1) communicate the vision for reducing WVC and maintaining connectivity for wildlife on US 26 to the public, local, state and federal decision-makers, and potential funders; 2) set the stage for ongoing collaboration with the Dubois community to ensure that local interests, needs and concerns continue to be addressed during the evolution and implementation of the migration strategy; and 3) build broad support for and ownership of the wildlife mitigation strategy.

## PRECONSTRUCTION WILDLIFE MONITORING

Preconstruction wildlife monitoring using motion-triggered cameras is recommended at select locations to further inform and refine the mitigation strategy, in particular,

- Existing bridges and box culverts to measure current levels of wildlife activity and use at these locations. Recommended monitoring locations include:
  - Segment 2 (Forest Boundary to Stoney Point)
    - Box culvert at MP 44.6
  - Segment 3 (Stoney Point to West City Limits)
    - Double box culvert at MP 49.3
  - Segment 5 (East Dubois to Tank Museum)
    - Wind River bridge at MP 56.97
    - Pipe culvert at MP 57.5
    - Arch culvert at MP 59.95
    - South Fork Torrey Creek bridge at MP 60.41
  - Segment 7 (Little Red Creek to Dinwoody Creek)
    - All bridge and small culvert locations (6)
- Potential new crossing structure locations. Preconstruction camera monitoring is used to capture a snapshot of the wildlife activity near the roadway at future crossing locations. These data can help in identifying species that approached the roadway prior to mitigation construction, though it cannot measure the frequency of cross-highway movements.
- At select locations along the ROW fence line in Segment 4 (Stoney Point to West City Limits). The purpose of camera monitoring along the fence line is to observe how wildlife respond to the

existing ROW barrier fence types. Monitoring should be targeted to known WVC hotspots with high levels of near-highway deer activity as observed by WGFD biologists.

Monitoring during the fall through spring months would be most valuable for evaluating migratory and wintering mule deer responses to the existing infrastructure, while year-round monitoring would contribute additional insight into wildlife responses to the infrastructure by resident herds and other large and meso mammal species.

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## APPENDICES




## APPENDIX A




### WILDLIFE SURVEY OF EXISTING BRIDGES AND CULVERTS ON US 26

The following table includes all medium and large sized bridges and culverts in the study area. Drainage culverts 6' in diameter and smaller with intermittent water flows were not surveyed, although they may offer potential functionality as wildlife passages for medium and small bodied species. Functionality for wildlife passage was primarily assessed with respect to mule deer, although deer and other wildlife may be unlikely to use structures without the installation of wildlife exclusion fencing to guide animals to the structure locations and prevent at-grade crossings of the roadway.




Milepost	Location Description	Wildlife Functionality	Photos
<b>Segment 1 – Togwotee Pass to Forest Boundary</b>			
<b>24.14</b>	Buried bridge over unnamed draw. Short stretch of buck and rail fence on south side of highway directs wildlife towards bridge. Farther east, there is a long, high retaining wall along the south side of US 26.	Signs of deer use under bridge, but deer tracks and game trails observed on sides slopes indicate that wildlife also make cross at-grade at this location.	
<b>32.48</b>	Brooks Lake Creek Culvert	Concrete box culvert with perennial stream not suitable for terrestrial wildlife passage.	<i>no image</i>
<b>Segment 2 – Forests Boundary to Stoney Point</b>			
<b>41.05</b>	7'7" diameter pipe culvert with flat concrete floor. Barbed wire ROW fence on both sides of structure.	Potential functionality for wildlife passage by medium sized mammals; deer are unlikely to use unless wildlife fencing prevented at-grade crossings.	

Milepost	Location Description	Wildlife Functionality	Photos
<b>41.42</b>	6' diameter corrugated metal pipe culvert. Barbed wire ROW fence on both sides of structure.	Potential functionality for wildlife passage by medium sized mammals. Structure is not functional for deer passage.	
<b>43.38</b>	Long Creek span bridge. Recently replaced riprap under bridge. Creek flows into Wind River on south side. ROW fence extends down to riverbanks.	Deer and elk passage deterred by riprap banks, riparian vegetation, and ROW fencing.	
<b>44.6</b>	10'W x 10'H concrete box culvert. Barbed wire ROW fence on both sides of structure. BLM lands on both sides of culvert.	Structure is suitable for deer passage and species such as black bear, mountain lion, bobcat, fox, and coyote. Deer and other wildlife use of culvert is unlikely without wildlife fence to guide animals to the structure and prevent at-grade crossings. Elk are unlikely to use this structure.	




Milepost	Location Description	Wildlife Functionality	Photos
<b>45.66</b>	Large span bridge over Wind River.	Bridge spans riparian banks. A horse corral abuts the bridge and the river on the southwest side of the bridge, limiting wildlife movement along that bank.	
<b>46.43</b>	Large span bridge over Wind River. Old highway bridge to south.	Gaps in ROW fence provide wildlife access. Wildlife pathways through fencing and under bridge. Structure has high functionality for wildlife passage.	
<b>47.6</b>	10' diameter corrugated metal pipe culvert. Stock pass leading into corrals on either side of US 26.	Structure is not suitable for wildlife passage due to adjacent fencing which prevents wildlife access.	




Milepost	Location Description	Wildlife Functionality	Photos
<b>47.8</b>	11'5" diameter corrugated metal pipe culvert. Pipe is skewed relative to the roadway. Drains wetland on north side and drops into Wind River at outlet on south side.	Structure is not suitable for wildlife passage.	
<b>Segment 3 – Stony Point to West City Limits</b>			
<b>49.3</b>	Double box culvert. Each chamber is 8'W x 8'H opening.	Structure is suitable for limited deer passage and species such as black bear, mountain lion, bobcat, fox, and coyote. Woven wire ROW fence is present along this section of roadway and runs over the top of the culvert, allowing wildlife access to the culvert. Wildlife functionality could be improved by installing short segments of 8'-high wildlife fencing to guide animals to the structure and prevent at-grade crossings.	
<b>52.04</b>	7'7" diameter concrete pipe culvert with concrete apron and wing walls. Stock pass with ROW fencing running over the top of the north side culvert entrance; south side drops immediately into Wind River.	Culvert size limits functionality for deer passage but could function as a crossing structure for other medium and small mammals. Fencing and gate in front of the south side culvert entrance prevent wildlife access.	









Milepost	Location Description	Wildlife Functionality	Photos
52.48	10'W x 10'H concrete box culvert. Stock pass with ROW fencing running over the top of the north side culvert entrance; at south side buck and rail fence guides livestock to pasture. Metal gate across south side entrance.	Hay pile on the south side of the culvert is a likely wildlife attractant. Structure is suitable for deer passage and species such as black bear, mountain lion, bobcat, fox, and coyote. However, fencing and gate in front of the south side culvert entrance prevent wildlife access.	
52.78	7'7" concrete pipe with concrete apron and wing walls. Stock pass with ROW fencing running over the top of the north side culvert entrance. Metal gate across south side entrance and double woven wire fence line to guide livestock.	Culvert size limits functionality for deer passage but could function as a crossing structure for other medium and small mammals. Fencing and gate in front of the south side culvert entrance prevent wildlife access.	
53.3	7'7" concrete pipe with concrete apron and wing walls. Stock pass with ROW fencing running over the top of both culvert entrances. Culvert is located just beyond the western town limit.	Culvert size limits functionality for deer passage but could function as a crossing structure for other medium and small mammals. Open access to both culvert entrances allows wildlife passage, but woven wire pasture fencing likely limits wildlife access into this area.	
Segment 4 – Downtown Dubois			
No bridges or culverts were surveyed in this segment			
Segment 5 – East Dubois to Tank Museum			
56.97	Large span bridge over Wind River. At east end of Dubois. Adjacent homes, barn and horse corral. Some riparian cover.	Structure is suitable for deer and other wildlife passage, but homes, human activity, and fencing limit wildlife access to structure.	no image






Milepost	Location Description	Wildlife Functionality	Photos
<b>57.17</b>	11'6"W x 7'H corrugated metal arch culvert with limited sediment on culvert floor. Adjacent to Wind River bridge. Pasture both sides. ROW fence in front of both structure entrances replaced with wildlife-friendly fence in 2020/21. Metal gate on south side.	Structure could be improved for wildlife passage by adding natural substrate to culvert floor and replacing a metal gate with a wildlife permeable alternative. Adjacent land uses (homes, horse pasture) limit the functionality of this structure for wildlife passage.	
<b>57.5</b>	7'5" diameter corrugated metal pipe culvert with some sediment buildup on culvert floor. Gravel pit to south east; cattle on north side. ROW fence in front of both structure entrances replaced with wildlife-friendly fence in 2020/21.	Anecdotally, this structure is known to see some use by deer. In general, deer and other wildlife are unlikely to use this culvert without wildlife fence to guide animals to the structure and prevent at-grade crossings. ROW fencing in front of the structure entrances at this location is wildlife permeable.	
<b>59.2</b>	Bridge over Jakey's Fork. Bridge spans heavily vegetated riparian banks.	Thick riparian vegetation and horse corral on northwest side limit wildlife access. Bridge spans heavily vegetated riparian banks. Deer and other wildlife use of culvert is unlikely without wildlife fence to guide animals to the structure and prevent at-grade crossings.	

Milepost	Location Description	Wildlife Functionality	Photos
<b>59.95</b>	11'6"W x 7'H corrugated metal arch culvert with sediment buildup on culvert floor. Private ranch on both sides of US 26. ROW fence in front of both structure entrances replaced with wildlife-friendly fence in 2020/21.	Structure is potentially functional for deer and other wildlife with the addition of wildlife fencing to guide animals to the structure and prevent at-grade crossings. ROW fencing in front of the structure entrances at this location is wildlife permeable.	
<b>60.34</b>	North Fork Torrey Creek. Bridge does not span riparian banks.	Structure is not suitable for wildlife passage.	
<b>60.41</b>	South Fork Torrey Creek. Bridge spans riprap banks	Structure could be improved for wildlife passage by creating dry pathways for deer and other wildlife through the riprap banks, although deer and other wildlife use is unlikely without wildlife fence to guide animals to the structure and prevent at-grade crossings. ROW fencing in this portion of the segment is wildlife permeable.	

Milepost	Location Description	Wildlife Functionality	Photos
<b>63.67</b>	Span bridge over Wind River. Long span with thick willows along riparian banks. Large ranch property with a conservation easement to south; horse corral on north side of bridge.	Old and new fencing along riparian corridor (outside of WYDOT ROW) impedes wildlife access to bridge.	
<b>Segment 6 – Tank Museum to Little Red Creek Canyon</b>			
<b>65.96</b>	7'5" diameter corrugated metal pipe culvert. Horse pasture on north side.	Culvert size limits functionality for deer passage but could function as a crossing structure for other medium and small mammals. Open access to both culvert entrances allows wildlife passage. Wildlife use of culvert is unlikely without wildlife fence to guide animals to the structure and prevent at-grade crossings.	
<b>66.91</b>	Long span bridge over Wind River. Thick riparian vegetation along riverbanks. Wildlife-friendly elk post ROW fencing on both sides of bridge.	Bridge offers potential functionality for deer and other wildlife passage but access is limited by thick vegetation cover, rocks and other debris along riparian banks.	

Milepost	Location Description	Wildlife Functionality	Photos
<b>Segment 7 – Little Red Creek Canyon to Dinwoody Creek</b>			
<b>69.42</b>	Bridge over Little Red Canyon Creek. Creek feeds into Wind River immediately to north. No ROW fence across north side of bridge; barbed wire ROW across south side.	Thick tree and shrub cover nearly obscure bridge entrances and limits functionality for wildlife passage.	
<b>69.94</b>	8' diameter corrugated metal pipe culvert with concrete bottom. Open access to both culvert entrances.	Structure is suitable for limited deer passage and species such as black bear, mountain lion, bobcat, fox, and coyote. Deer and other wildlife use of culvert is unlikely without wildlife fence to guide animals to the structure and prevent at-grade crossings.	
<b>70.49</b>	Bridge over Red Creek. Short bridge span over small creek. Barbed wire ROW fence.	Wire/stone bank armoring and barbed wire ROW fence impedes wildlife passage.	



Milepost	Location Description	Wildlife Functionality	Photos
<b>71.06</b>	11'W x 7'H corrugated metal arch culvert with concrete bottom. Open access to both culvert entrances.	Structure is potentially functional for deer and other wildlife with the addition of wildlife fencing to guide animals to the structure and prevent at-grade crossings.	
<b>72.25</b>	12' diameter corrugated metal pipe culvert with concrete bottom. Open access to both culvert entrances.	Structure is potentially functional for deer and other wildlife with the addition of wildlife fencing to guide animals to the structure and prevent at-grade crossings.	
<b>73.28</b>	Dinwoody Creek. Rocky riverbanks with thick riparian vegetation. Homes to west. Barbed wire ROW fence.	Barbed wire ROW fence impedes wildlife access to structure.	

## APPENDIX B

### PUBLIC MEETING COMMENTS AND RESPONSES

#### *MEETING #1 – DECEMBER 8, 2020*

This meeting was a follow-up to an initial public meeting held in December 2017 during which the issue of wildlife conflict on US 26 was first presented, and participants shared their perspectives and ideas for addressing the problem. The goal of this follow-up meeting was to establish the need for a wildlife mitigation strategy for US 26 to proactively identify how targeted mitigation investments can have the greatest impact on reducing WVC while preserving wildlife connectivity. At this meeting, the project team presented initial findings and concepts, and solicited public feedback. [A recording of this presentation is available on the WGFD website](#); public comments and responses to these comments are documented below.



Question/Comment	Implement?	Comments/Response
<b>GENERAL COMMENTS</b>		
I would also like to thank Rene Schell for making this probably one of the best Zoom meetings I have attended. She was very thorough in responding to registration with a welcome email, sending a reminder, providing meeting data ahead of time and also sending a tutorial for anyone who wasn't familiar with the Zoom platform. All of that planning and preparation paid off with an excellent user experience. Thank you!		Thank you for attending, listening in, and taking the time to give us feedback.
As a resident of Lander, I frequently drive through this area, and actually had a collision with a mule deer at the red bluffs area south of Dubois a few years ago (\$12,000 in damage). I also gave a ride to a couple from Colorado who hit a deer in the very same spot a couple years later. I enjoyed being able to sit in and listen to the data and ideas.		Thank you for attending, listening in, and taking the time to give us feedback.
I will not be able to participate in the December 8 virtual meeting but wish to offer the following thoughts. The issue of deer and vehicle collisions is a great concern of mine. I have lived along Highway 26/287 for many decades at the Spring Ranch, Jack Anderson Ranch, M-J Ranch, and Grazing Association Ranch. Today my wife and I own property bordering the highway. My point is that I have witnessed the annual slaughter of deer on this portion of the highway for many years. The number of collisions, the cost, the waste, and the danger to humans continues to increase as the number and speed of traffic has increased. I understand we cannot prevent all wildlife/vehicle collisions, but we can do a better job of reducing the carnage.		We acknowledge that many members of the public have this concern and appreciate your comments.
I was surprised by the statistics and also surprised at the very minimal effectiveness of inexpensive solutions such as reduction in speed limit. The consultant did a thorough job of explaining various measures that could be taken and their		Thank you for attending, listening in, and taking the time to give us feedback.

relative effectiveness. I felt she did an excellent job of explaining how a project with what seems to be an initially high cost will actually pay for itself over a period of time.		
We appreciate you wanting to maintain the herd numbers - but how many are being killed by autos?		The carcass and collision data that have been collected show 188 large mammals in 2020, 182 large mammals in 2019. This does not include those that are not found or picked up.
Why does it cost over \$5,000 per deer?		This number was calculated using average insurance claim cost for these types of collisions as well as the restitution cost (the cost to the State of Wyoming to grow one of these animals). For example, WYDOT estimates the average costs per reported deer-vehicle collision are \$11,600 in injury and property damage costs, and WGFD estimates the economic value of each killed mule deer is \$4,000. Since nearly 6,000 deer-vehicle collisions occur in Wyoming each year, this means that deer-vehicle collisions total approximately \$24-29 million per year in Wyoming in injury and damage costs and an additional \$20-23 million per year in wildlife costs (Riginos et al. 2016). Collision numbers also indicate roads are having a substantial impact on Wyoming's large mammals. The number of dead animals due to WVCs alone is cause for concern. For mule deer the number of animals killed by vehicles represents approximately 2-4% of the total population each year.
Given the problem across most of the Rocky Mountains, are the states cross coordinating strategies. In addition, would a multi-state movement gain support for federal grants?		For the most part, states are working independently on mitigation projects within their state boundaries; however, in areas such as the WY/CO border, where herds are known to cross into both states, some conversations have been initiated to discuss multi-state mitigation projects. Western states and non-profit organizations that represent multiple western states are seeking new funding sources for mitigation projects through the Transportation Bill and the Wildlife Corridors Act. Secretarial Order 3362, signed in 2017, directs all agencies in the Department of the Interior to work with state wildlife agencies to conserve big game

		habitat, in particular migration corridors and winter range, and provides some funding for research and mitigation.
With regard to the comment of interagency coordination. Has anyone coordinate with Defense Threat Reduction Agency (DTRA) for emerging technology development that this project would serve as vetting measure (that means free Passive IR type equipment) for a limited amount of time.		While we are not engaging with the DTRA. There is work being done to evaluate wildlife detection systems as part of the mitigation plan.
Is there a plan to address the increasing whitetail populations and have their impacts to mule deer movement behavior been evaluated?		Hunting seasons to provide opportunity to harvest white-tailed deer are evaluated each year by WGFD Biologists and Wardens. Season proposals are based on evaluations of deer numbers or trends, management goals or objectives, and public input. Based on research to date there is very little indication white-tailed deer impact mule deer populations. WGFD is not aware of any impact of white-tailed deer on mule deer movement behavior.
PLEASE provide more information on hunting timeframes and any extensions of the timeframe.		Hunting seasons dates and limitations are evaluated annually. In the Dubois area hunting seasons for elk and deer are generally during the month of October. Some seasons, for example for cow elk, provide extended hunting opportunity into November and December.
The cost of about \$750,000 per year to the State of Wyoming was mentioned in the article mentioning this meeting tonight? Where did that number come from? Actual dollars cost to the State? Or was it cost to drivers and insurance companies for those collisions? My assumption is that most animal / vehicles collisions were with doe or fawn deer.		Please see #8 above
Deer collar points – if one deer stays close to the road would reports as multiple points? i.e. how do you get 20,000?		Collars for this study were set to collect locations every 2 hours. Deer collared for a 2 year period would thus have a maximum of around 8,700 location points. This was by design so we could get detailed information about migratory paths when animals were moving fast. That of course means that once deer settled in areas near the highway in late October, their location was recorded up to 12 times per day. This was true for the rest of the year as well so the

		proportion of points near the highway is representative of the total time they reside near the highway on an annual basis.
Last year we had 182 crashes. As of today we have had 151 with most of December left.		Thank you for your comment.
Has there been any notable increase in collisions since the speed limit was increased several years ago?		There has not been an increase in collisions. While the speed limit did increase, the driving speed did not change.
I also noticed the area between Lander and Hudson on Wyoming 789 ranks higher than many areas for wildlife vs. motor vehicle collisions and I know of numerous deer and at least two moose killed in this area. I drive on a portion of this segment regularly and I can attest that the dynamic messaging signs are minimally effective and my knee-jerk reaction has been to reduce the speed limit, but I see now that this would not be a good solution. Once the solution is underway in Dubois I would like to see the segment of Wyoming Highway 789 between Hudson and Lander addressed to find solutions and I would be happy to help in some way.		WGFD and WYDOT will continue to work on other locations identified.
<b>MITIGATION STRATEGIES QUESTIONS &amp; COMMENTS</b>		
Can you relocate any captures animals In Florida they have had great success with highway fencing on both sides of highway and use of crossovers... rarely see a crash incident. may want to contact your counterparts to discuss. They area where i see this approach is near highway 29 and the Naples section	Yes	Mule deer are the primary concern with wildlife vehicle collisions in the Dubois area. It has been demonstrated, throughout the West, mule deer relocation efforts are not very successful. Mule deer are very, very tied to the habitats, migration routes, and even individual plants they have learned to rely on. They come back to same winter ranges, summer ranges and use the same migration paths every year. They learned to do this as fawns from their mothers. When they are relocated to a foreign landscape they are literally lost and their chances of survival are quite low.
Finally, at one of the WGFD and WDOT public meetings, it was suggested that high-fencing and wildlife overpasses and underpasses be retrofitted between Dinwoody and the forest boundary. I scoffed at this idea at first, but after reflection and	Yes	Vehicle volume will increase over the years and be dependent on future development.

witnessing the ever increasing traffic and collisions, I now believe this proposal should be examined. According to the cost of collisions at \$746,000 per year, high-fencing, overpasses and underpasses would pay for themselves. How much traffic will use this highway fifty years from now?		
<p>We recently drove home from southern Utah visiting family. From St. George to Salt Lake City about 350 miles of I-15. There are sections of that Interstate that have 10-12 foot sheep-tight fence on both sides, with underpasses constructed specifically for wildlife, as well as what I call 'get out of jail free' ramps leading from the highway side where they could jump out of the highway area. UDOT has taken advantage of roads that already pass under I-25 to allow animals to use those by way of strategically placed high fencing.</p> <p>Specifically, there is an extensive project currently underway around mile marker 148 (measured from the Nevada border North). New high 10-12 foot high sheep-tight fencing with the ramps out of the Interstate placed frequently along the project. Has WYDOT or the G&amp;F contacted Utah for specifics on that project? Numbers of animals? Numbers of collisions / damages / human injuries? Cost per mile of the fencing, or ramps, etc.?? Cost of underpasses? Funding sources?</p>		We have not contacted Utah about that specific project but we are using some of their state's data to inform mitigations in this plan.
Has it been demonstrated that existing stock passages are effective? They appear to have lower ceilings and are dark.		Some of the larger stock passes (e.g., 10'x10') may be functional for deer passage provided they are not too long or dark and that the entryways are not blocked by gates or fencing. Smaller stock passes (≤6') are unlikely to pass deer but may be used by other species, such as black bear, bobcat, coyote, fox, and other medium and small species.
Does WYDOT have future highway construction projects/bridge replacements proposed in this area that wildlife crossings could be a part of to reduce mobilization/construction costs?		WYDOT does not have planned upcoming projects to replace any structures. As needs arise on infrastructure WYDOT will research options to incorporate wildlife crossings.
Other than the bridges across the Wind River, have any engineers with Game and Fish or WYDOT looked at high density crossing areas that would allow for underpasses or overpasses.	Yes	Yes, new wildlife crossing structures in targeted locations are one of the mitigation strategies being considered.

How long does it take to construct an overpass?	Yes	A wildlife overpass can be constructed in one construction season. Projects with multiple crossing structures and other transportation improvements may require construction over multiple years.
How long do these overpasses or underpasses last before needing significant maintenance?	Yes	The lifespan of a crossing structure is 75 years or more, requiring little maintenance during that timeframe. Fencing lasts 20 or more years and requires more regular maintenance to prevent and repair holes or gaps.
Perhaps you or G&F is familiar with what was tried around Thermopolis and between Basin and Greybull with the red reflectors? Are the results of the study and the results available?		The results of the reflectors were very minimal. In fact, at one point white canvas bags were placed over the reflectors to cover them. The White bags were as effective as the reflectors. WYDOT is no longer installing these red reflectors
why did they put barbed wire around Pete's Pond, which is public land and a meeting place for the deer?		This is a highway right of way fence. We will evaluate fence configuration to see if we can make it better for wildlife passage.
Lynn Stewart with DAWGS said there is fencing on the east side of Pete's pond because it is private property on that side		This is a highway right of way fence. We will evaluate fence configuration to see if we can make it better for wildlife passage.
Today I watched a herd of Bighorns stuck on the highway at Pete's Pond because only the baby could get past the barbed wire fence. I did not get an answer from WDOT last night on why this fence is in existence. Would you care to see the video I made of the sheep today, which explains my concern?		This is a highway right of way fence. We will evaluate fence configuration to see if we can make it better for wildlife passage.
and 2) Consider solar signage displaying speed limit and approaching vehicle speed (like used in Teton National Park),		WYDOT does not install the radar feedback signs. They allow other agencies such as Towns or Counties to install and maintain them. Ongoing studies continue to research how effective these signs are when not moved from location to location.
Session was well planned and staffed with G&F experts to answer a wide range of questions. This started the process of engaging and informing the public of the challenges and potential solutions to lessen highway death of wildlife. Additional thoughts are: 1. Engage highway patrol's	Yes	The Wyoming Highway Patrol has been short staffed over the last years. Luckily, they have been able to get a trooper in the Dubois area recently. They are engaged in this effort in.



enforcement (at least periodically) if day/night speed limits are established,		
During the 1970's, winter and nighttime traffic was much less than today. Night vehicle traffic was virtually non-existent, folks stayed home after dark. Society has changed and today from my window I observe constant traffic 24 hours a day, seven days a week. 18-wheeled truck traffic greatly increased following the Togwotee Pass highway reconstruction. Daily I watch the speed of vehicles on the highway and can fairly accurately tell which are locals (those driving around 50 MPH) and those who are outsiders (those driving 70 - 80 MPH). Most folks pay attention, but many times I have watched in horror as speeding vehicles race past deer standing on the road and never even touch their vehicle's brakes.		This is not solely a visitor/tourist issue. Speed studies report all vehicles. More locals drive these areas than visitors. Commonly we see communities blaming others when in reality the majority of the local drivers are driving as fast if not faster.
I favor a different day time and nighttime speed limit. The speed limit needs to be strictly enforced. I favor more warning signs including the radar-activated flashing signs that tell motorists their speed.		WYDOT does not install the radar feedback signs. They allow other agencies such as Towns or Counties to install and maintain them. Ongoing studies continue to research how effective these signs are when not moved from location to location. WYDOT has engaged in day and nighttime speed. Through studies it has been shown that metal static signs are not effective in reducing speeds. WYDOT does have electronic speed limit sign that change depending on the time of day. We are actively studying this technology to determine its effectiveness.
I drove from Veo, UT to Enterprise, UT recently. One of the things they have done is to paint the word DEER across the lane at the location where the collisions occur. I lost count at 15+ in the roughly 25 mile drive! Never has my attention been drawn to a deer problem by a 'wildlife on road' sign along the side of the road in WY like it was to a large lane-filling DEER painted on the roadway		WYDOT will reach out to UDOT to explore possibilities. Our concern is many drivers view these large signs as debris on the road and swerve to avoid it. On a 65+ MPH roadway this can be very dangerous for motorists. Follow-up with UDOT confirmed that these in-road messages are unsanctioned and not recommended.
Second, more aggressive signage must be installed here. We have heard of painting "DEER" on the road at every deer collision location, in both day and night high visibility paint. We		WYDOT will reach out to UDOT to explore possibilities. Our concern is many drivers view these large signs as debris on the road and swerve to avoid it. On a 65+ MPH roadway this

believe that this would definitely get the attention of out-of-state and commercial drivers to the danger of these two segments of road.		can be very dangerous for motorists. Signage in general by itself is not highly effective. Follow-up with UDOT confirmed that these in-road messages are unsanctioned and not recommended.
Mitigation strategies - habitat enhancements distant from the highway designed to attract deer was mentioned in the 2017 meeting but not mentioned tonight. The Fish and Stark meadows attract 100's of deer. Can we work with landowners to implement such habitat improvements to attract deer away from highways.		This is a good suggestion. WGFD will continue to evaluate habitat enhancement projects to improve conditions for wildlife including mule deer. Such projects will need to be carefully planned so they do not increase wildlife movement across the highway and increase collisions.
If acceptable with landowner(s) at Red Rocks, would it be possible to install a solar watering system in addition to planting unpalatable grasses along the roadside. Though I haven't seen deer, I've observed bighorns crossing the road, jumping the fence along the river and proceeding to drinking in the river. Lots of deer are observed about a mile east of this location.	Yes	Keep in mind the largest 'landowners' along this section of highway are the Shoshone and Arapaho tribes.
Another mitigative measure mentioned in 2017, was the use foliage detractants - i.e. sprays - adjacent to the highway. These detractants work best in arid environments similar to Dubois where it doesn't have to be reapplied due to precipitation. This mitigative measure was not mentioned tonight. Has it been considered no longer feasible.		The implementation of wide spraying of a deterrent is not feasible. the amount of spray needed and the reapplication rate does not allow it to be a viable option. Also it could have other impacts to humans and pets.
The detractant sprays do not kill vegetation they just make it unattractive - i.e. tastes bad due to pepper components. The vegetation remains. No erosion issue with them.		The implementation of wide spraying of a deterrent is not feasible. the amount of spray needed and the reapplication rate does not allow it to be a viable option. Also it could have other impacts to humans and pets.
Follow-up on detractants: I followed through with a visited with my friend, Dr. Bill Andelt (now retired) , who conducted research on foliage repellents at CSU. He had the following points: Eggs – they had good luck with mixing a spray of 1 pt egg to 4 pts water. This became an olfactory repellent – he thinks due to the presence of fatty acids which are also present in carnivore feces. Or maybe deer/elk just don't like the smell of eggs once		The implementation of wide spraying of a deterrent is not feasible. the amount of spray needed and the reapplication rate does not allow it to be a viable option. Also it could have other impacts to humans and pets.

<p>they age. The “spray” provided avoidance after the equivalent of 4” of rain and lasted over a several month period. Again, this seems to be an olfactory repellent vs a taste repellent. You have to mix yourself.</p> <p>Capsaicin – mix at 1/100 pts and worked well. Mix of 1/10 pts. worked really well!!! Holds up well to rain (4 inch equivalent of rain) and lasts several months. Available commercially. Serves as a taste repellent. Deer/elk would take a bite and spit it out. Not an olfactory repellent. Thus, they would still pass through a given area but not hang around and forage. Note: I used a sample from Andelt in Jackson for moose and ornamental browsing (aspen). The landowner observed moose taking a couple of bites, spitting it out, walking to the neighbors aspen to browse and not returning the rest of the winter. Given the level of ornamental damage in the Jackson area, I thought about launching a side business. Never got around to it – could have been rich!!!</p> <p>Sooo, probably limited use of repellants for the Dubois hwy issues unless one wanted to keep deer/elk from passing through a site-specific area or one didn’t want them browsing in a site-specific area.</p>		
<p>First, I am not in favor of the planting of unpalatable plants, especially grasses. They can spread and may create a, cheat grass like, problem.</p>		<p>WYDOT does already plant unpalatable species in the right-of-way during reclamation of construction projects to deter animals from foraging next to the road. WYDOT uses native types of nonpalatable species.</p>
<p>My other comment is what may help drivers to be alerted to deer entering the highway. A few years ago, in the dark, in just the right circumstance, where the highway dropped slightly away, in the distance, I noticed one of the delineator reflectors, on top of the post, blinking off and on, which got my attention. In a second, I noticed deer coming onto the highway. With the highway dropping away behind them it put them high enough to line up with the reflector behind them. By that blinking of the reflector, which got my attention, it gave me time to slow down</p>		<p>This Idea will be discussed for feasibility. The delineator poles have to meet certain standards by federal regulations. More research will be done.</p>

and avoid the deer. My thought was, that if there was another reflector lower on the post, where crossing deer would cut its reflection, this would alert the driver of something entering the highway. Another thought, would be to paint the entire post, use reflecting paint. Although, that may make it harder to see deer right next to the highway. With a little education to get drivers to be looking for this blink, blink of the reflectors, either of these would be a low-cost way to get drivers attention.		
Third, we have noted that the establishment of a large Bison pasture south of Highway 26, immediately east of the National Museum of Military Vehicles and south of the Upper Wind River. This large pasture was constructed by Mr. Dan Starks utilizing deer friendly fencing, eliminating invasive grass species, and re-introducing historic and native species such as Buffalo Grass. This pasture has access to excellent ground cover, water (the Wind River), and nutritious fodder, all attractive to Mule Deer. This pasture has attracted large numbers of Mule Deer SOUTH of the highway and the Wind River, removing them from Highway 26. This is a conservation success, and the Wyoming Fish and Game, Bureau of Land Management, U.S. Forest Service, and local ranchers and property owners should be encouraged to implement similar measures, which will significantly reduce the incidence of Mule Deer crossing Highway 26, or loitering on its shoulders.		WGFD will continue to evaluate habitat enhancement projects to improve conditions for wildlife including mule deer. Such projects will need to be carefully planned so they do not increase wildlife movement across the highway and increase collisions.
If most of the area was installed with high 'sheep-tight' fencing wouldn't that focus animal crossings to specific locations where the fences were more able to be crossed? Some of those could be existing bridges or crossings. There would have to be ramps for animals to get out of the roadway in those areas.... Finally, could we identify CWD positive deer and only allow them to be involved with the collisions? JUST KIDDING:)	Yes	
A late season doe fawn hunting season may help		It is true a late season deer hunt would be an effective way to reduce the overall deer population. It is also true that fewer deer would subsequently result in reduced

		wildlife/vehicle collisions. However, this is not compatible with wildlife management objectives for the area and a significant population reduction would likely result in substantial public dissatisfaction. Keep in mind that a large reduction in wintering deer throughout the upper Wind River valley would drastically reduce hunting opportunities for sportsmen not only around Dubois but all the way to Jackson Hole and south to the Hogback drainage. Since many of the deer in this population stage for spring and fall migration along the Wind River and U.S. Highway 26 there would still be large numbers of deer along the highway even if the population was drastically reduced through late fall hunting seasons. The population has been relatively stable for the past decade and is slightly below the WGFD's population objective currently.
<b>FUNDING QUESTIONS &amp; COMMENTS</b>		
Future WDOT road construction and reconstruction must factor in the cost of wildlife/vehicle collision mitigation in the total costs. Wildlife concerns should not be an after-thought to new roads and increased collisions.		WYDOT takes in to account the needs of each section of roadway and weighs them in a cost benefit analysis and premeasured warrants. Any savings by reducing collisions is not seen by WYDOT but by society the, tax payer. WYDOT is charged with wisely and effectively using tax dollars in the betterment of the public. Wildlife concerns are part of every design process of a major construction project.
Could tolls for driving on US 26 meet the financial constraint		No. Tolling every vehicle on the highway would not come close to paying for the wildlife needs.
Some funding should be available from auto insurance companies...		Insurance companies lack a financial incentive for funding mitigation projects because they pass the cost of wildlife-vehicle collisions on to their customers in the form of rate increases. There may be some incentive to support projects at the local level through sponsorship or other tactics that earn companies positive marketing and community goodwill.
and 3) Insurance companies deal in statistics and cost/profits so when approaching them for financial assistance show them why		See above

it would be cost effective to support whatever solution is being proposed AND tell them you will post their company name on the initiative (bridge, underpass, signage, etc.). Also state that as leaders in their industry you will get local, state and nation press on the company's participation for saving wildlife, and people lives and helping to avoid costly accidents.		
isn't there funding for wildlife crossings from the sale of conservation license plates?		These funds are being used throughout the state to aid in wildlife projects. as of December 2020 \$390,000.00 had been raised by this initiative.
Great projects all around! Is there a fundraising campaign? Also, has an account been established to pool donations to these projects?		Currently no, but once the mitigation strategy is completed in summer 2021, we will begin working on education, outreach, and fundraising to implement the strategy.



## *MEETING #2 – APRIL 27, 2020*

*This section will be completed following the April meeting.*